

Appendix R - Part 1

Hydrogeological Assessment Report

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Regional Municipality of York Markham, Ontario



Regional Municipality of York Markham, Ontario

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February 2023 300052314.0000



Hydrogeological Existing Conditions Review for Warden Avenue and Kennedy Road Environmental Assessment Studies between Major Mackenzie Drive East and Elgin Mills Road East February 2023

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1.0 Introduction

R.J. Burnside & Associates Limited has been retained by the Regional Municipality of York (York Region) to provide hydrogeological services in support of the Class Environmental Assessment (EA) Studies for the proposed improvements to Warden Avenue and Kennedy Road from Major Mackenzie Drive to Elgin Mills Road. The purpose of this report is to characterize existing groundwater conditions in the area of the proposed work, identify any potential hydrogeological impacts from the proposed improvements to Warden Avenue and Kennedy Road and assess dewatering requirements at watercourse crossings.

1.1 Site Description

The Study Areas for the Class EA studies are illustrated in Figure 1 and include lands within 500 m of the subject roads of Warden Avenue and Kennedy Road between Major Mackenzie Drive East and Elgin Mills Road in the City of Markham. The Kennedy Road study area also includes a segment of road 120 m north of Elgin Mills Road and the Warden Avenue study area includes 65 m south of Major Mackenzie Drive. The proposed road improvements will be limited to the right-of-way (ROW) along the roads and will not extend into private properties. The width of the right-of-way in the areas to be improved is expected to be 41 m mid-block and 43 m at intersections.

2.0 Background Review

This report has been completed based on a review of published geological and hydrogeological information including topography, physiography, surficial geology and bedrock geology mapping as well as existing geotechnical and hydrogeological reports completed within the Study Areas.

The main reports used to complete this desktop study of existing hydrogeological conditions are listed below:

- Berczy Glen Master Environmental Servicing Plan, Berczy Glen Landowners Group, Stonybrook Consulting Inc., et al., 2020.
- Angus Glen Master Environmental Servicing Plan, Stonybrook Consulting Inc., et al., October 2017.
- Robinson Glen Master Environmental Servicing Plan, Stonybrook Consulting Inc., et al., 2017.
- Geotechnical Investigation, Schedule C Class EA Study for Improvements to Warden Avenue, From Major Mackenzie Drive to North of Elgin Mills Road, Markham, Ontario. Golder Associates, August 6, 2021.

- Geotechnical Investigation, Schedule C Class EA Study for Improvements to Kennedy Road, From Major Mackenzie Drive to North of Elgin Mills Road, Markham, Ontario. Golder Associates, August 30, 2021.
- Berczy, Bruce, Eckardt and Robinson Creeks Subwatershed Study (AMEC Foster Wheeler, 2019).

Hydrogeological data within these reports include geotechnical information, groundwater level monitoring, surface water monitoring, hydraulic conductivity testing and water quality sampling. The data collected as part of previous studies have been incorporated into the analyses and interpretations conducted as part of the current assessment. A complete list of references used for this report is included in Section 8.0.

3.0 Topography and Drainage

The Study Areas are characterized by flat to rolling topography with slopes generally being southwards towards the watercourse valleys. Along Warden Avenue, the ground elevations range from 229 meters above sea level (masl) at Elgin Mills Road down to 210 masl at Major Mackenzie Drive East. Along Kennedy Road, ground elevations range from 225 masl near Elgin Mills Road down to 205 masl at Major Mackenzie Drive (Figure 1).

The Study Areas are in the Rouge River watershed within the jurisdiction of the Toronto and Region Conservation Authority (TRCA) and occupy portions of the Berczy Creek, Bruce Creek and Robinson Creek subwatersheds. Along Warden Avenue a tributary of Bruce Creek crosses under the ROW approximately 825 m north of Major Mackenzie Drive flowing southeast and the main branch of Berczy Creek flows under Warden Avenue just south of Major Mackenzie Drive. Along Kennedy Road there is a watercourse crossing over Bruce Creek just north of Elgin Mills Road.

Parts of the provincially significant Bruce and Berczy Creek Wetland Complex are mapped within the Study Areas. The wetlands are mostly located along the Bruce and Berczy Creek watercourses and only a small portion of the wetland extends to the ROW. Groundwater monitoring completed within the wetlands as part of MESP studies indicate seasonal discharge of groundwater occurs in the wetlands and along watercourses.

4.0 Geology

The Study Areas are located within the physiographic region known as the Peel Plain (Chapman and Putnam, 1984). The Peel Plain consists of a thin veneer of lacustrine silt and clay deposited over glacial till with a flat to rolling topography with generally more incised slopes in the vicinity of the watercourses.

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Regional surficial geology mapping published by the Ontario Geological Survey (2011) show the surficial sediments within the Study Areas include silty sand glacial till, coarse textured glaciolacustrine deposits (sand/silt), fine textured glaciolacustrine deposits (silt/clay) and modern alluvial deposits along Bruce Creek (Figure 2).

Soil information obtained by local drilling was used to refine the surficial geology interpretation in the Subwatershed Study (SWS) (AMEC Foster Wheeler, 2019). The results of the refinement were generally consistent with the published regional mapping with respect to overall soil types however discrepancies with respect to the spatial distribution of various surficial soil types were noted in the SWS (AMEC Foster Wheeler, 2019). The published mapping suggests large areas of sand at surface however, based on drilling programs the dominant sediment type found at surface across the area was till.

Bedrock beneath the Study Areas consists of layered grey shale bedrock of the Blue Mountain Formation (OGS, 1991). Bedrock is generally found at an elevation of approximately 120 masl to 130 masl (approximately 100 m below ground surface).

4.1 Local Geology

Local drilling programs completed in the Study Areas as part of previous studies indicate that shallow soils consist generally of till with interbedded layers of sand, silty sand, and silt (Golder, 2021, Stonybrook Consulting Inc., et al., 2017). The locations of boreholes and monitoring wells within the Study Areas are shown in Figures 3 and 4. Borehole logs with soil descriptions are provided in Appendix A.

In 2021, Golder completed a total of 17 boreholes along Warden Avenue within the Study Area ranging in depth from 2 metres below ground surface (mbgs) to 9 mbgs. A total of 24 boreholes were drilled along Kennedy Road within the Study Area by Golder in 2021. The boreholes ranged in depths from 2.0 m to 17.1 mbgs. The geotechnical drilling confirmed that the shallow soils encountered in the Study Areas generally consist of glaciolacustrine silt and clay and sandy silt to silty sand till with interbedded layers of sand, silty sand and silt.

4.2 Stratigraphy

The stratigraphy in the Markham area including the Study Areas was modelled by the TRCA for the Rouge River Watershed Plan (2007) and further refined during the Berczy, Bruce, Eckardt and Robinson Creeks Subwatershed Study (AMEC Foster Wheeler, 2019) and Berczy Glen MESP (Stonybrook et al., 2020), Angus Glen MESP and Robinson Glen MESP (Stonybrook et al., 2017). There are three major overburden

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aquifer systems identified in the vicinity of the Study Areas. The overburden aquifers are described in order of increasing depth as the:

- Oak Ridges Aquifer Complex (ORAC), formed within the Oak Ridges Moraine (ORM) sediments and sometimes referred to as the Upper Aquifer.
- Thorncliffe Aquifer (or Middle Aquifer), formed by the sandy sediments of the Thorncliffe Formation and generally separated from the overlying ORAC by the Newmarket till aquitard.
- Scarborough Aquifer (Lower Aquifer), formed by sandy sediments of the Scarborough Formation overlying the bedrock, and separated from the Thorncliffe Aquifer by the Sunnybrook aquitard.

In the North Markham area, the ORAC tends to be thin and sporadic as the aquifer is pinching off to the south. Within the Study Areas, the ORAC has been identified as isolated layers and lenses of sand/gravel and silty sand within 5 m to 15 m below ground surface (Angus Glen MESP and Robinson Glen MESP, 2017).

Site-specific geological information obtained from the geotechnical boreholes and groundwater monitoring wells drilled within the Study Areas (Appendix A) and local MECP well records (Appendix B) have been used to prepare schematic cross-sections along Warden and Kennedy Road within the Study Areas to illustrate the shallow stratigraphy. The cross-section locations are shown in Figures 3 and 4 and the cross-sections are provided in Figures 5 and 6.

The cross-section along Warden Avenue (Figure 5) shows a thick layer of fine-grained soils (glaciolacustrine silt and clay and glacial till deposits) at surface, interspersed with lenses and layers of sand of variable thickness and extent. The sand layers are interpreted to be discontinuous lenses of ORAC sediments separated by finer grained layers of silty sand and silty sand till. Because of the discontinuous nature of the occurrence of ORAC sediments, the aquifer is not interpreted to be present in this location.

The cross-section along Kennedy Road (Figure 6) also shows a layer of fine-grained soils overlying a layer of sand/gravel and silty sand at depths of 1 m to 10 mbgs and a thickness of 5 to 10 m. The coarse-grained layer is interpreted to be the ORAC and is generally continuous across the Study Area.

The Thorncliffe aquifer is interpreted to be generally found between elevations 160 masl and 180 masl (i.e., more than 35 mbgs) in the vicinity of the Study Areas (Figures 5 and 6). (Stonybrook et al., 2020). The Scarborough aquifer was interpreted to be found between 120 masl and 130 masl (Stonybrook et al., 2020).

5.0 Hydrogeology

5.1 Local Groundwater Use

The Study Areas are situated immediately north of the currently urbanized area of Markham and properties in the Study Areas north of Major Mackenzie Drive still rely on private wells for water supply. The Ministry of the Environment, Conservation and Parks (MECP) maintains a database that provides geological records of wells drilled in the province. The locations of MECP well records for water supply wells within the Study Areas (500 m from road alignment) are illustrated in Figures 7 and 8. It is noted that the well locations listed in the MECP records are approximations only and may not be representative of the actual well locations in the field.

Within the Warden Avenue Study Area, 88 well records are listed as water supply wells (Figure 7). The majority of the water supply wells are drilled wells screened in the overburden at depths ranging from 15 mbgs to 97 mbgs. Eight of the wells were bored wells with depths of 4 to 12 mbgs. Three of the wells were completed in the bedrock at depths of approximately 72 m to 99.7 mbgs. Most of the well records are located south of Major Mackenzie within a rural subdivision (Figure 7).

Within the Kennedy Road Study Area, 38 of the well records are listed as water supply wells (Figure 8). The majority of the water supply wells are drilled wells screened in the overburden at depths ranging from 9 mbgs to 177 mbgs. Eleven of the wells were bored wells with depths of 5 to 12 mbgs. Two of the wells were completed in the bedrock at depths of approximately 53 m to 71 mbgs.

The MECP well records suggest that most of the local private wells within the Study Areas tap the Thorncliffe Aquifer (more than 30 m below ground surface) for water supply; however, some shallow wells are completed in the ORAC sediments. The reported well yields are generally considered good and sufficient for typical domestic use with yields ranging from 0.2 L/s to 15 L/s (2 gpm to 200 gpm).

The Study Area is within the North Markham Future Urban Area (FUA) and the majority of the private wells identified will be decommissioned and residents will be connected to municipal water.

Based on review of available MECP data there is only one active Permit to Take Water (PTTW) identified within 500 m of the Study Areas. The permit is associated with irrigation wells located on the Angus Glen Golf Club Ltd.

5.2 Groundwater Levels

The shallow groundwater in the Study Areas has been observed in hydrogeological and geotechnical studies (see Section 2.0). The locations of monitoring wells in or near the Study Areas are shown in Figures 3 and 4 and hydrographs showing groundwater level data are provided in Appendix C.

Groundwater levels were also measured in wells along the road alignments by the Region in May 2021. The Region's groundwater level data is provided in Table C-1, Appendix C.

A review of available groundwater data indicates that along Warden Avenue groundwater elevations range from 212 masl to 227 masl with depths ranging from <1 mbgs to 5 mbgs (Appendix C). It should be noted that the groundwater levels were measured in wells screened at depths from 6 mbgs to 12 mbgs and shallow groundwater levels may be reflective of an upward gradient in the till. The interpreted depth to groundwater within the Warden Study Area is illustrated in Figure 9. The depth to water table varies with topography being shallower in areas of low topography and deeper in areas of high topography. There were no flowing wells identified in the groundwater monitoring data.

A review of available groundwater data indicates that along Kennedy Road groundwater elevations range from 202 masl to 221 masl with depths ranging from <1 mbgs to 9 mbgs (Appendix C). It should be noted that the groundwater levels were measured in wells screened at depths from 4 mbgs to 12 mbgs and shallow groundwater levels are reflective of an upward gradient in the till. Water was not encountered during drilling until depths of at least 4 mbgs (see borehole logs Appendix A). There were no flowing wells identified in the groundwater monitoring data.

The interpreted depth to groundwater within the Kennedy study area is illustrated in Figure 10. Most of the land along Kennedy Road is shown as having groundwater levels between 2 m and greater than 4 mbgs. Some shallow levels are mapped on the southern portion of Kennedy Road just north of the Major Mackenzie Drive East intersection (Figure 10).

5.3 Water Quality

A review of groundwater quality reported in the Berczy Glen, Angus Glen and Robinson Glen MESP studies was completed. Impacts from agricultural land use is observed in some wells with reported nitrate concentrations ranging from 0.12 mg/L up to 18.5 mg/L. Elevated sodium and chloride have been observed in monitoring wells located near Warden Avenue and Kennedy Road with chloride concentrations ranging from 55 mg/L to 361 mg/L and sodium concentrations ranging from 7 mg/L up to 227 mg/L.

5.4 Source Protection

The Study Area is located in the Toronto and Region Source Protection Area. Municipal supply for Markham is sourced from Lake Ontario, therefore, there are no well head protection areas in the vicinity of the Study Area. Mapping from the MECP Source Protection Information Atlas indicates that the Study Area includes lands mapped as highly vulnerable aquifer (HVA) and significant groundwater recharge areas (SGRA) as illustrated in Figures 11 and 12.

Aquifer vulnerability refers to the susceptibility of an aquifer to potential contamination. Some degree of protection for groundwater quality from natural and human impacts is provided by the soil above the water table. The degree of protection is dependent upon the depth to the water table (for unconfined aquifers) or the depth of the aquifer (for confined aquifers) and the type of soil above the water table of aquifer. As these two properties vary over any given area, the degree of protection or vulnerability of the groundwater to contamination also varies. The surficial soils of the Study Area are generally low hydraulic conductivity, fine grained soils, so the shallow depth to the ORAC is the primary reason that the area would be considered to have high vulnerability.

Mapping of HVAs were completed by TRCA on a regional scale and should only be used as a guide, and not site-specific planning decisions. The results of the site-specific geological and hydrogeological work completed for previous studies (see Section 2.0) suggests that there are some areas where aquifer layers are close to surface within the Study Areas however a review of water well indicates that the deeper Thorncliffe Aquifer is the main aquifer used for private well supplies and the shallow sediments of the ORAC are not used extensively.

SGRAs are shown on the MECPs Source Protection Atlas based on analyses completed by the TRCA in 2016. The areas mapped as SGRAs generally correspond to areas shown to have surficial sand on the OGS surficial geology mapping. Site-specific drilling within the Study Area did not encounter surficial sands but rather silt and clay or sandy silt/silty sand glacial till soils which limit significant recharge from occurring.

As part of this assessment, Burnside also reviewed Areas of Concern for York Region based on mapping available on the York Region's Source Water Protection website. Our review indicated that there are no areas of concern for groundwater in the Study Areas and that the closest Area of Concern is located over 3 km northwest of Warden Avenue at Highway 404.

5.5 Hydrogeological Conceptual Model

A hydrogeological conceptual model is not a physical nor a numerical model but is an interpretation of the local and regional hydrogeological conditions and a description of how the various components of the system relate to each other. It can be simplified to be an interpretation of the groundwater flow conditions and directions within an area. In the Study Areas, groundwater is interpreted to infiltrate within the surficial low permeability fine grained sediments and will tend to move vertically to recharge the ORAC sediments. It is expected that in areas where ORAC sediments are not encountered minimal groundwater will occur. As noted above in Section 5.2, water levels measured in the Study Area are reflective of conditions in the vicinity of well screens that are a minimum of 4 m to 6 m below grade and excavations that are shallower than these depths may not encounter groundwater.

Upward gradients that have been identified in the above sections may be due to groundwater being encountered in association with the ORAC sediments or in close proximity to watercourses/low topographic areas where groundwater from shallow sediments is discharged. The above hydrogeological conceptual model therefore indicates that groundwater conditions may only be a concern in areas where road work is deep enough to encounter ORAC sediments or in topographic low spots such as around watercourses.

6.0 Construction Dewatering

6.1 Watercourse Crossings

There are two watercourse crossings within the Warden Avenue study area and one watercourse crossing within the Kennedy Road study area. A summary of the crossings are provided in Table 1 below.

Watercourse	Existing	Proposed	Dewatering
Crossings	Structure		Required
Warden Avenue - Berczy Creek, 50 m south of Major Mackenzie Drive East	Structural plate corrugated steel pipe culvert.	Structure is recommended for replacement but will be constructed separate from the road construction.	Yes, but will not be completed as part of road reconstruction.

Table 1:	Watercourse Crossings	s within Study	/ Areas
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Watercourse Crossings	Existing Structure	Proposed	Dewatering Required
Warden Avenue - Tributary of Bruce Creek, 845 m north of Major Mackenzie Drive East	Two 0.6 m diameter PVC culverts.	Replacement with road construction.	Yes.
Kennedy Road - Bruce Creek, north of intersection of Elgin Mills Road and Kennedy Road	Concrete arched soffit bridge.	Existing structure will remain.	None.

6.2 Water Crossing at Tributary of Bruce Creek, Warden Avenue

An estimate of dewatering volumes required for the installation of a new culvert where the tributary of Bruce Creek crosses Warden Avenue was completed as part of a Dewatering Assessment Report completed by Burnside in December 2021 (Burnside, 2021). Details on the dewatering assessment and assumptions used in the calculations are provided in Appendix D. Based on soils information and an estimated hydraulic conductivity, a maximum dewatering volume of about 11,300 L/day was estimated with a zone of influence of 11 m (Burnside, 2021). This volume is below the requirement for an Environmental Activity and Sector Registry (EASR) or Permit to Take Water (PTTW).

6.3 Installation of Services

Municipal servicing including watermain, storm sewer and sanitary sewers may be installed during road improvements in support of the Markham Future Urban Area redevelopment. Based on groundwater levels for the Study Areas, some dewatering of sediments may be required during the installation of underground infrastructure. An assessment of dewatering requirements will be completed on a project basis to support necessary permits. Dewatering volumes will be calculated based on the proposed depth of excavation, dimensions of the excavated area and the hydraulic properties of the soils encountered. Depending on the dewatering volumes predicted, water taking permits will be required such as an EASR or a PTTW from the MECP. An assessment of potential impacts from dewatering is required to obtain these permits as well as monitoring and mitigation plans to address potential impacts. These impacts should be further evaluated based on more detailed information on service installation depths obtained later in the design process.

7.0 Potential Impacts

Based on the hydrogeological conditions of the Study Areas, potential receptors that could be impacted by road construction and short-term construction dewatering include private wells and surface water features. It is noted that these impacts are likely to be of short duration and limited to the period during which actual construction is taking place. After construction it is expected that the area should return to pre-construction conditions as no adverse changes are predicted.

7.1 Impacts on Private Wells

Road construction may impact shallow groundwater wells that are located in close proximity to the construction. Potential impacts include the cutting off or removal of sand lenses that contribute to the well or damage to the well integrity due to vibrations or heavy machinery use. It is expected that only shallow wells in close vicinity to the construction may be impacted in this way. Wells completed within 15 m of surface have been considered the most vulnerable to potential impacts from development as excavations associated to road construction and installation of services will generally be within the first 15 m of the overburden. Wells with depths recorded as less than 15 m are shown in Figures 7 and 8.

There are no water well records mapped within the zone of influence for the watercourse crossing along Warden Avenue.

It is noted that the locations for wells listed in the MECP records are approximations only and may not be representative of the precise well locations in the field. There may also be wells present that are not documented in the MECP database. To confirm the potential for construction impacts, the locations of the wells should be confirmed in a well survey conducted within each Study Area to identify any shallow wells in close proximity to the road widening that could be potentially impacted by the construction. The well survey is recommended to be completed during the detailed design phase of the project. Any wells identified as being susceptible to impacts should have baseline water quality and water levels collected and be monitored through construction.

A well interference and reporting protocol should be established before construction that outlines the actions taken should a complaint from a private well owner be received and ensures that a supply of water is provided for the private resident. Mitigation measures should include the following:

- Notification of residents of construction with contact information.
- A reporting and investigation protocol to address complaints.
- Supply of alternate water source in case of confirmed impact.

7.2 Impacts to Surface Water

The estimated dewatering volumes for the Bruce Creek Tributary crossing are minor and temporary in duration. Impacts to the watercourse are not anticipated.

7.3 Long-Term Impacts

Runoff from winter maintenance activities on roads can infiltrate into the groundwater resulting in elevated sodium and chloride in the groundwater. Additional lanes on the road will result in greater surface area for application of road salt and therefore a greater loading of sodium and chloride to groundwater. These impacts may be mitigated by the implementation best management practices for road salt application.

Potential impacts to groundwater discharge in wetlands or watercourses at road crossings are not anticipated but can be mitigated through the use of Low Impact Development (LID) features in the improved road corridors which will be considered as part of these EA studies. Groundwater flow may occur at increased rates along trenches and excavations constructed as part of the servicing works. Industry best practices for construction of service trenches, including the building of cut off walls will ensure that groundwater flow is not re-directed along trenches.

8.0 References

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Figures





34 Surficial Geology.mxd Print Date: 2023/02/24 Time: 12:17 PM



LEGEND





100

200



400

Metres

600

BURNSIDE

Client / Report REGIONAL MUNICIPALITY OF YORK

WARDEN AVENUE & KENNEDY ROAD EA STUDIES HYDROGEOLOGICAL ASSESSMENT

Figure Title

BOREHOLE, MONITORING WELL AND CROSS-SECTION LOCATIONS (WARDEN AVENUE)

Drawn	Checked	Date	Figure No.
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LEGEND

PROPOSED RIGHT-OF-WAY (ROW - 43m) MONITORING WELL (RJB, 2015) MONITORING WELL (YORK REGION) MONITORING WELL (SOIL ENG., 2013) MONITORING WELL (GOLDER, 2021) MONITORING WELL (NO LOG) BOREHOLE (GOLDER, 2021) BOREHOLE (SOIL ENG., 2013) BOREHOLE (SOIL ENG., 2004) BOREHOLE (PML, 2014) Ð BOREHOLE (AMEC, 2012)

MECP WELL RECORD LOCATION Client / Report REGIONAL MUNICIPALITY OF YORK CROSS-SECTION LOCATION KEY WARDEN AVENUE & KENNEDY ROAD EA STUDIES HYDROGEOLOGICAL ASSESSMENT Figure Title BOREHOLE, MONITORING WELL AND CROSS-SECTION LOCATIONS (KENNEDY ROAD) Drawn Checked Date FEBRUARY 2023 SK SC 200 400 100 Scale Project No. 1:7,500 300052314 Metres

BURNSIDE

Figure No.

4

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LEGEND

	100m BUFFER AROUND ROW		0 TO 1m BELOW GR	ADE	Client / Report			
	PROPOSED RIGHT-OF-WAY (ROW - 41m)		1 TO 2m BELOW GRA	ADE		REGIONAI	- MUNICIPALITY OF \	(ORK
	WATERCOURSE		2 TO 4m BELOW GR	ADE	WARDE	N AVENU	E & KENNEDY ROAD	EA STUDIES
\bullet	MONITORING WELL (RJB, 2015)					HYDROGE	EOLOGICAL ASSESSI	MENT
+	MONITORING WELL (YORK REGION)		>4m BELOW GRADE		Figure Title			
+	MONITORING WELL (SOIL ENG., 2013)							
+	MONITORING WELL (GOLDER, 2021)					(WA	ARDEN AVENUE	R :)
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		Metres			1:7,500		300052314	

DEPTH TO GROUNDWATER:

BURNSIDE

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Work Areas/035564 Highr

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LEGEND

LEGEND				DEPTH TO	GROUNDWATER:				A	BURNSIC)E
	100m BUFFER AROUND ROW				0 TO 1m BELOV	V GRADE		Client / Report	-		
	PROPOSED RIGHT-OF-WAY (ROW	′ - 43m)			1 TO 2m BELOV				REGIONAL	MUNICIPALITY OF	YORK
	WATERCOURSE										
+	MONITORING WELL (RJB, 2015)				2 10 4m BELOV	V GRADE		WARDE	HYDROGE	E & RENNEDY ROAL	MENT
+	MONITORING WELL (YORK REGIO	N)			>4m BELOW GF	RADE		Figure Title			
+	MONITORING WELL (SOIL ENG., 20	013)						Figure Tille	INTE	RPRETED DEP	тн
\blacklozenge	MONITORING WELL (GOLDER, 202	:1)							ТО	GROUNDWATE	R
\bullet	MONITORING WELL (NO LOG)								(KI	ENNEDY ROAD)
							Ņ	Drawn	Checked	Date	Figure No.
		0	100	200	400	600		SK	SC	FEBRUARY 2023	10
								Scale		Project No.	10
				Metro	es			1:7,500		300052314	

k/02_Pn

/035564 Highm

Work Area

File Name:Nigel/SI







Appendix A

Borehole Logs

PROJECT: 20146456

LOCATION: N 4862071.08; E 632899.94

RECORD OF BOREHOLE: C1 BORING DATE: January 13, 2021

SHEET 1 OF 1

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HAMMER TYPE: AUTOMATIC DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SOIL PROFILE SAMPLES BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 40 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW WpH - WI (m) 40 60 80 10 20 30 40 GROUND SURFACE 213.50 C ASPHALT (210 mm thick) 0.00 213.29 FILL - (SP) SAND, some gravel, trace fines; brown; moist 0.2 1 AS 212.67 FILL - (CI) sandy SILTY CLAY, some 0.83 2 SS 8 gravel, dark brown and grey; cohesive, w>PL, firm to soft ¢ SS 3 3 2 211.37 (CL) SILTY CLAY, brown to grey; cohesive, w>PL, stiff to very stiff 2 13 SS 0 4 10 - Becoming grey at a depth of 2.9 m 3 S:/CLIENTS/REGION OF YORKIMAJOR MACKENZIE DRIVE/02 DATA/GINTIMARKHAM WARDEN&KENNEDY RD.GPJ GAL-MIS.GDT 3/23/21 5 SS 16 Stem Truck Mount B57 Hollow 209.46 4 (CL-ML) SILTY CLAY-CLAYEY SILT and SAND, some gravel; grey (TILL); cohesive, w<PL, hard 4.04 mm O.D. 50 SS 50/ 6 0 5 6 7 SS 50/ SS 50/ 8 0 205.65 END OF BOREHOLE 8 NOTES: 1. Water was encountered at a depth of 3.1 m during drilling. 2. Water measured in open borehole at a depth of 4.3 m (El. 209.2m) upon 9 completion of drilling. 10 GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: YS 1 : 50 CHECKED: TO

PROJECT:	20146456	

DEPTH SCALE METRES

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LOCATION: N 4862076.92; E 632892.20

RECORD OF BOREHOLE: C2 BORING DATE: January 12, 2021

SHEET 1 OF 1

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HAMMER TYPE: AUTOMATIC DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 40 NUMBER STANDPIPE ELEV. ТҮРЕ SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -0^W WpH - wi (m) 40 60 80 10 20 30 40 GROUND SURFACE 213.50 ASPHALT (315 mm thick) 0.00 213.18 0.32 Crushed granular; brown AS 212.76 FILL - (CI) sandy SILTY CLAY, some 0.74 gravel, dark brown and grey; cohesive, w>PL, stiff to firm 2 SS 13 MH ю SS 3 4 211.37 (CL) SILTY CLAY, brown; cohesive, w>PL, very stiff to stiff 2 13 SS 0 4 16 5 SS 14 Truck Mount B57 Stem Hollow 209.46 (CL-ML) SILTY CLAY-CLAYEY SILT and SAND, some gravel; grey (TILL); cohesive, w<PL, hard 4.04 Ö 20 6 SS 70 0 SS 50/ 7 50/ 0.05 8 SS С 205.68 END OF BOREHOLE NOTES: 1. Water was encountered at a depth of 6.1 m during drilling. 2. Water measured in open borehole at a depth of 4.3 m (El. 209.2m) upon completion of drilling.

GOLDER

S:/CLIENTS/REGION_OF_YORK/MAJOR_MACKENZIE_DRIVE/02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_3/23/21 GTA-BHS 001

DEPTH SCALE 1:50

LOGGED: YS CHECKED: TO
PROJECT:	20146456
LOCATION:	N 4861296.93; E 633061.47

RECORD OF BOREHOLE:

BORING DATE: January 20, 2021

P1

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10-5 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -OW - WI Wp (m) 10 20 40 60 80 20 30 40 GROUND SURFACE 213.50 0 ASPHALT (340 mm thick) 0.00 213.16 0.34 Crushed granular; brown 1A AS 0.51 212.79 0.71 FILL - (SP) SAND, some gravel; trace 1B Truck Mount B57 ter fines; brown; moist (CL) SILTY CLAY and SAND, some gravel; brown (TILL); cohesive, w<PL, very stiff to hard Hollow 2 SS 22 0 150 mm 3 SS 97 0 ΜН -211.52 2 END OF BOREHOLE 1.98 NOTE: 1. Borehole open and dry upon completion of drilling. 3 S: CLIENTSIREGION_OF_YORKMAJOR_MACKENZIE_DRIVE/02_DATA/GINTI/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_3/23/21 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: YS 1:50 CHECKED: TO

PROJECT: 20146456 LOCATION: N 4861450.81; E 633030.53

RECORD OF BOREHOLE: P2 BORING DATE: January 6, 2021

SHEET 1 OF 1

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HAMMER TYPE: AUTOMATIC DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW - WI WpH (m) 10 40 60 80 20 30 40 20 GROUND SURFACE 217.60 0 0.00 217.40 0.20 ASPHALT (200 mm thick) Crushed granular; brown 1 AS Truck Mount B57 Sterr 216.85 FILL - (SP) SAND, trace fines; brown; non-cohesive, moist, compact 0.75 Hollow 2 SS 17 0 0 216.23 1.37 (ML) SILT and SAND, trace gravel; brown; non-cohesive, moist, compact 200 200 SS 3 15 MH NP 215.62 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole was open and dry upon completion of drilling. 2. NP= Non-plastic 3 S:/CLIENTS/REGION_OF_YORK/MAJOR_MACKENZIE_DRIVE/02_DATA/GINTI/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_3/23/21 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond GOLDER DEPTH SCALE LOGGED: YS 1:50 CHECKED: TO

PROJECT:	20146456
LOCATION:	N 4861664.23; E 632982.24

RECORD OF BOREHOLE: P3 BORING DATE: January 6, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW Wp - wi (m) 40 10 40 20 60 80 20 30 GROUND SURFACE 219.80 0 ASPHALT (230 mm thick) 0.00 219.57 FILL - (SP) SAND, some gravel, trace 0.23 1 AS fines; brown; moist 219.30 FILL - (CI) sandy SILTY CLAY, some gravel; brown and dark grey; cohesive, w>PL, stiff 0.50 Stem Truck Mount B57 Hollow 2 SS 11 mm O.D. I 200 SS 0 3 10 217.82 XX 2 END OF BOREHOLE 1.98 NOTE: 1. Borehole was open and dry upon completion of drilling. 3 S:/CLIENTS/REGION_OF_YORK/MAJOR_MACKENZIE_DRIVE/02_DATA/GINTI/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_3/23/21 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: YS 1:50 CHECKED: TO

PROJECT: 20146456 LOCATION: N 4861851.29; E 632945.93

RECORD OF BOREHOLE: P4 BORING DATE: January 6, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HYDRAULIC CONDUCTIVITY, k, cm/s DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. ТҮРЕ SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW Wp - wi (m) 10 20 40 60 80 20 30 40 GROUND SURFACE 216.50 0 ASPHALT (60 mm thick) 8:86 Crushed ganular; brown 1 AS 215.98 0.52 FILL - (CI) sandy SILTY CLAY, some sand, some gravel; dark grey, organic inclusions; cohesive, w>PL, stiff Truck Mount B57 Stem Hollow 2 SS 8 0 50 mm O.D. 215.13 (SM) SILTY SAND, some gravel; brown; non-cohesive, moist, compact 1.37 SS 3 19 ΜН 214.52 2 END OF BOREHOLE 1.98 NOTE: 1. Borehole was open and dry upon completion of drilling. 3 SICLIENTSIREGION_OF_YORKIMAJOR_MACKENZIE_DRIVE/02_DATAIGINTIMARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_3/23/21 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: YS 1:50 CHECKED: TO

LOCATION: N 4862041.54; E 632903.86

RECORD OF BOREHOLE: P5

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: January 6, 2021

HAMMER TYPE: AUTOMATIC

	T		SOIL PROFILE			SAI	MPL	ES					HYDRA		ONDUCT	TIVITY,	Т	(1)	
ES		Ĕ		OT		~		m	20 RESISTAN	40	60	80	10	к, стл/s) ⁻⁶ 1() ⁻⁵ 1	0-4 1	0 ⁻³ L	STING	PIEZOMETER OR
TH S TH S		∑ U	DESCRIPTION	A PL	ELEV.	IBER	ΡE	S/0.3	SHEAR ST	RENGTH	nat V	. + Q- ●	W	ATER CO	ONTENT	PERCE	ī NT	DITIC	STANDPIPE
DEP DEP	į			'RAT	DEPTH (m)	NUN	Ł	LOW	Cu, kPa		rem \	/.⊕ U-O	Wp				WI	ADI	INSTALLATION
	-	<u> </u>		ST	()			ß	20	40	60	80	1(0 2	0 3	30 4	0		
- 0	\vdash		ASPHALT (220 mm thick)		213.50 0.00	$\left \right $													
E					213.28														
E		Igers	Clushed grandial, blown		0.22	1	AS												
È	57	em AL	EILL (SP) SAND some gravel trace		212.84														
F	ount B	ov St	fines; brown; moist		212.65 0.85	2A	SS	12											
- 1	м М	Holl	FILL - (CI) sandy SILTY CLAY, some gravel; black and grey, organic			2B													-
F	Ta	D.O.	inclusions; cohesive, w>PL, stiff to firm																
F		50 mr																	
-		÷				3	SS	4							0				
E,				***	211.52														_
È 2			END OF BOREHOLE		1.98														_
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LOCATION: N 4862147.36; E 632884.51

RECORD OF BOREHOLE: P6 BORING DATE: January 6, 2021

DATUM: Geodetic

PT/	CP	T HAMMER: MASS, 64kg; DROP, 760mm														HAM	MER T	YPE: AUTOMATIC
	p p	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETH RESISTANCE, BLO	RATION DWS/0.3	3m)	HYDR/	AULIC C k, cm/s	ONDUC	TIVITY,	Т	ە_	
			LOT		ď		Зm	20 40	60	80	,`	1	D ⁻⁶ 1	0 ⁻⁵ 1	0-4 1	0-3 ⊥	STIN	PIEZOMETER OR
	s Z	DESCRIPTION	IA PI	ELEV.	MBE	Ϋ́РЕ	/S/0.	SHEAR STRENGT	H nat	V. +	Q - ●	w	ATER C	ONTENT	PERCE	NT	DITIO	STANDPIPE INSTALLATION
	<u>א</u> ון א		TRA	DEPTH (m)	Ň	۲.	L0	си, кРа	rem	ı v. ⊕	u - O	Wp	⊳ 	—0 ^W		WI	LAB	
+'	۵		S				8	20 40	60	80)	1	0 2	20 3	30 4	40		
⋼⊢	-	GROUND SURFACE		214.10												-		
		Crushed granular: brown	****	0.00														
	ers	C .		213.62	1A													
	u Aug	FILL - (SP) SAND, some gravel; trace		0.48 213.44	1B	AS	-											
t B57	Sten	FILL - (CI) SILTY CLAY, some sand.		0.66														
1 UNOW	ollow	some gravel; dark brown, organic			2	SS	9						0					
ъс,	Ū.																	
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	150 r																	
					3	SS	9											
			×××	212.12			-											
				1.50														
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		1. Borehole was open and dry upon completion of drilling																
		completion of dilling																
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ЕРТ	нs	CALE							~								10)GGED: YS
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SHEET 1 OF 1

LOCATION: N 4862351.03; E 632840.88

RECORD OF BOREHOLE: P7 BORING DATE: January 6, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. ТҮРЕ SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW Wp - wi (m) 40 60 80 10 20 30 40 20 GROUND SURFACE 219.20 0 ASPHALT (230 mm thick) 0.00 218.97 Crushed granular; brown 0.23 1A AS FILL - (SP) SAND, some gravel; trace fines; brown; moist 0.39 1B 218.54 0.66 Stem Truck Mount B57 FILL - (CI) sandy SILTY CLAY, some gravel; brown and dark grey, organic inclusions; cohesive, w>PL, very stiff Hollow 2 SS 19 0 217.83 150 mm (ML) sandy SILT, some gravel; brown (TILL); non-cohesive, moist, compact 1.37 SS 22 0 3 11 217.2 2 END OF BOREHOLE 1.98 NOTE: 1. Borehole was open and dry upon completion of drilling 3 S:/CLIENTS/REGION_OF_YORK/MAJOR_MACKENZIE_DRIVE/02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GPJ_GAL-MIS.GDT_3/23/21 4 5 6 7 8 9 10 GTA-BHS 001 DEPTH SCALE GOLDER LOGGED: YS 1:50 CHECKED: TO

LOCATION: N 4861359.73; E 633031.43

RECORD OF BOREHOLE: S1 BORING DATE: January 15, 2021

SHEET 1 OF 2

DATUM: Geodetic

'n	THOD		SOIL PROFILE	L.	1	SA	AMPL	.ES	PYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	NAL	PIEZOMETER
	BORING MF		DESCRIPTION	TRATA PLC	ELEV. DEPTH (m)	NUMBER	түре	BLOWS/0.3n	20 40 60 80 HEAR STRENGTH nat V. + Q - ● cu, kPa rem V. ⊕ U - C	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	ADDITION LAB. TEST	OR STANDPIPE INSTALLATION
		+	GROUND SURFACE	0	215 10						$\left \right $	
0	٦	╡	ASPHALT (125 mm thick)	~~~~	0.00							
1		-	Crushed granular; brown FILL - (SP) SAND, brown, trace fines; non-cohesive, moist, dense		0.13 <u>214.68</u> 0.42	1	AS	- 30				50 mm Dia. PVC Monitoring Well
						3	ss	37				
2		-	(SM) SILTY SAND, some gravel; brown (TILL); non-cohesive, moist, very dense	<u> </u>	212.97	4	ss	64		φ		
3				<u> </u>	· · · · ·	5	ss	71				∇
4	unt B57	w Stem Augers	(SM) SILTY SAND, some gravel; brown to grey; non-cohesive, wet, very dense		211.06		_					January 29, 2021
5	Truck Mo	200 mm O.D. Holk	- Becoming grey at a depth of 5.6 m			6	ss	79		0		Bentonite
6						7	ss	83				
7		-	(CL-ML) SILTY CLAY-CLAYEY SILT and SAND, some gravel; grey (TILL); cohesive, w <pl, hard<="" td=""><td></td><td>208.01 7.09</td><td>8</td><td>ss</td><td>50/ 0.08</td><td></td><td>0</td><td></td><td>Sand 2</td></pl,>		208.01 7.09	8	ss	50/ 0.08		0		Sand 2
8												Sand and Screen
9			END OF BOREHOLE NOTES:		205.68 9.42	9	ss	50/ 0.13				
10		-				 	<u> </u>		-+	+++		

GTA-BHS 001 S:CCLIENTSIREGION_OF_YORKMAJOR_MACKENZIE_DRIVE/02_DATAIGINTMARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT 3/23/21

LOCATION: N 4861359.73; E 633031.43

RECORD OF BOREHOLE: S1 BORING DATE: January 15, 2021

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

The second se	PIEZOMETER OR STANDPIPE INSTALLATION
Image: Description Image: De	STANDPIPE NSTALLATION
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
10 CONTINUED FROM PREVIOUS PAGE 0 0 00 <	
1. Water was encountered at a depth of 4.6 m during drilling. 2. Groundwater level was measured at a depth of 4.4 mbgs (El. 210.7m) after well installation. 3. Groundwater level was measured in monitoring well at a depth of 3.7 mbgs (El. 211.4m) on January 29, 2021.	
2. Groundwater level was measured at a depth of 4.4 mbgs (El. 210.7m) after well installation. 3. Groundwater level was measured in monitoring well at a depth of 3.7 mbgs (El. 211.4m) on January 29, 2021.	
depth of 4.4 mbgs (El. 210.7m) after well installation. 3. Groundwater level was measured in monitoring well at a depth of 3.7 mbgs (El. 211.4m) on January 29, 2021.	
3. Groundwater level was measured in monitoring well at a depth of 3.7 mbgs (El. 211.4m) on January 29, 2021.	
monitoring well at a depth of 3.7 mbgs (El. 211.4m) on January 29, 2021.	
- 19	
	r YS
1:50 GOLDER CHECKED	

BORING METHOD

DEPTH SCALE METRES

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Truck Mount B57 Hollow Sterr

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(GP) sandy GRAVEL, trace fines; grey; non-cohesive, wet, very dense

1. Water was encountered at a depth of 4.6 m during drilling.

END OF BOREHOLE

NOTE:

LOCATION: N 4861546.26; E 633002.39

GROUND SURFACE

RECORD OF BOREHOLE: S2

SHEET 1 OF 1

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

BORING DATE: January 15, 2021 HAMMER TYPE: AUTOMATIC DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 40 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW WpH - wi (m) 40 60 80 10 20 30 40 20 219.80 ASPHALT (120 mm thick) 0.00 FILL - (SM) gravelly SILTY SAND, brown; non-cohesive, moist 1 AS 0 М 219.05 0.75 FILL - (CI) sandy SILTY CLAY, some gravel; brown and black, organic inclusions; cohesive, w>PL, stiff 2 SS 11 SS 3 9 217.67 (SM) SILTY SAND, trace to some 2 13 gravel; brown; non-cohesive, moist to wet, dense to very dense SS 4 35 С 5 SS 54 - Becoming wet at a depth of 4.6 m 6 SS 48 0

0

S:/CLIENTS/REGION_OF_YORK/MAJOR_MACKENZIE_DRIVE/02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_3/23/21 GTA-BHS 001

DEPTH SCALE 1:50

GOLDER

7 SS 50/

8 SS 50/

212.71

212.05

7.7

LOGGED: YS

CHECKED: TO

LOCATION: N 4861732.90; E 632961.79

RECORD OF BOREHOLE: S3 BORING DATE: January 13, 2021

SHEET 1 OF 2

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HAMMER TYPE: AUTOMATIC DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SOIL PROFILE SAMPLES BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 40 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW WpH - WI (m) 40 60 80 10 20 30 40 GROUND SURFACE 218.90 C 0.00 ASPHALT (200 mm thick) FILL - (SP) SAND, some gravel, trace 50 mm Dia. PVC Monitoring Well fines; brown; moist AS 1 218.20 FILL - (CI) sandy SILTY CLAY, trace 0.70 gravel, brown and black; organic inclusions; cohesive, w>PL, firm to stiff 2 SS 7 MH SS 3 13 2 216.77 (CL) SILTY CLAY and SAND, some 2 13 gravel; brown (TILL); cohesive, w~PL, stiff SS 4 13 216.00 2.90 (SM) SILTY SAND, some gravel; brown (TILL); non-cohesive, moist, dense 3 S:/CLIENTS/REGION OF YORKIMAJOR MACKENZIE DRIVE/02 DATA/GINTIMARKHAM WARDEN&KENNEDY RD.GPJ GAL-MIS.GDT 3/23/21 5 SS 44 <u>∑</u> January 29, 2021 214.86 4.04 4 (CL-ML) SILTY CLAY-CLAYEY SILT and SAND, some gravel; grey (TILL); cohesive, w<PL, hard Truck Mount B57 Stem ss 50/ Hollow 0 6 5 . O mm 8 Bentonite 6 SS 7 77 7 2.20 Sand SS 8 65 0 8 Sand and Screen 9 90/ 0.13 9 SS 209.32 9.58 END OF BOREHOLE NOTES: 10 CONTINUED NEXT PAGE GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: YS 1:50 CHECKED: TO

PROJECT:	20146456	

LOCATION: N 4861732.90; E 632961.79

RECORD OF BOREHOLE: S3 BORING DATE: January 13, 2021

SHEET 2 OF 2

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

	ш	ор	SOIL PROFILE			SA	MPLE	s	DYNAM	IC PEN		0 3m	2	HYDR/	AULIC CO	ONDUCT	FIVITY,	Т	. (7)	
	SCAL	ЕТН		0TO		~		۳	2	0 4	0 6	0 8	0	1	0 ⁻⁶ 1(D ⁻⁵ 1	0-4 10	_{D-3} ⊥	STINC	PIEZOMETER OR
	NETR	N D N	DESCRIPTION	A PL	ELEV.	ABEF	ĥ	/S/0.3	SHEAF	STREN	GTH r	at V. +	Q - ●	w	ATER CO	L ONTENT	PERCE	NT	DITIO	STANDPIPE
	DEF	30RI		TRAT	DEPTH (m)	NUN	F	3LOW	Cu, kPa	3	r	em V. ⊕	U- O	w	⊳ 	-0 ^W	I \	WI	LAB	
-		ш		ς,	. ,				2	0 4	06	08	0	1	0 2	0 3	80 4	0		
ŀ	- 10		CONTINUED FROM PREVIOUS PAGE Borehole was open and dry upon				+													
			completion of drilling.																	-
-			2. Groundwater level was measured in monitoring well at a depth of 3.5 mbgs																	-
-			(El. 215.4m) on January 29, 2021																	-
	- 11																			-
-																				-
																				-
																				-
-																				-
	- 12 -																			-
																				-
																				-
																				-
121	- 13																			
3/23/																				-
DT																				-
MIS.0	-																			-
-JAG	- 14																			
PJ (-
RD.O																				-
λ																				-
ENNE	- 15																			-
N&K																				-
ARDE																				-
// M																				-
KHAN	16																			-
MAR																				-
LNIS	:																			-
VTA/O																				-
2_D/	- - 17																			
VE/0																				-
DR																				-
NZIE																				-
ACKE																				-
₩ ₩	- 18																			-
AJO																				-
N/W																				-
ρ																				-
57	- 19																			
GIO																				-
SIRE																				-
ENT																				-
s:/CL	- 20																			-
100																				
BHS	DE	PTH S	CALE				I			$\sim \sim$			2						LC	OGGED: YS
3TA-I	1:	50								30	LL		۲						CH	ECKED: TO

LOCATION: N 4861956.56; E 632915.36

RECORD OF BOREHOLE: S4 BORING DATE: January 13, 2021

SHEET 1 OF 1

DATUM: Geodetic

Solit PROFILE SAMPLES SAMPLES DYNAMIC PENETRATION RESISTANCE, BLOWS0.3m HYDRAULIC CONDUCTIVITY, k, cm/s Image: Construction of the standard standa
Line Description Image: Constraint of the second seco
Image: construct of the second seco
0 ASPHALT (215 mm thick) 0.00 213.58 Curshed granular; brown 0.22 213.34 0.40 18 FILL - (SP) SAND, some gravel, trace fines; brown, moist 0.63 7 FILL - (CI) sandy SILTY CLAY, some gravel; brown and black, organic inclusions; cohesive, w>PL, stiff 0.63 2 3 SS 2 (SM) gravelly SILTY SAND, brown (TILL); non-cohesive, moist, compact 211.67 2.13
1 Curshed granular; brown 0.22 213.34 1A AS FILL - (SP) SAND, some gravel, trace fines; brown, moist 0.46 B B FILL - (CI) sandy SILTY CLAY, some gravel; brown and black, organic inclusions; cohesive, w>PL, stiff 0.63 2 0.63 3 1 0 2 SS 11 3 SS 9 3 SS 9
1 FILL - (SP) SAND, some gravel, trace 0.46 1B AS - 1 FILL - (CI) sandy SILTY CLAY, some gravel, trough and black, organic inclusions; cohesive, w>PL, stiff 0.63 - - 2 (SM) gravelly SILTY SAND, brown (TILL): non-cohesive, moist, compact 3 SS 9
1 Image and Sill TY CLAY, some gravel; brown and black, organic inclusions; cohesive, w>PL, stiff 0.63 2 SS 11 2 Image and Sill TY CLAY, some gravel; brown and black, organic inclusions; cohesive, w>PL, stiff 0 0 0 3 SS 9 0 0 0 0
1 gravel, brown and black, organic 2 SS 11 2 inclusions; cohesive, w>PL, stiff 2 SS 11 3 SS 9 (SM) gravelly SILTY SAND, brown 4 2.11.67 (ILL): non-cohesive, moist, compact 4 2.13
2 (SM) gravely SiLTY SAND, brown flux 211.67 (SM) gravely SiLTY SAND, brown flux 2.13
2 (SM) gravely SILTY SAND, brown of 2 211.67 (SM) gravely SILTY SAND, brown of 2 213
2 (SM) gravelly SILTY SAND, brown 4 4 211.67 (SM) gravelly SILTY SAND, brown 4 4 21.13 (TILL): non-cohesive, moist, compact
2 (SM) gravely SILTY SAND, brown 4 1 2.11.67 (TILL): non-cohesive, moist, compact 4 1 2.13
(SM) gravelly SILTY SAND, brown 4 4 2.13 (TILL): non-cohesive, moist, compact 4:11
(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
3 3 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
1 1 1 BS7
B G (CL-ML) SILTY CLAY-CLAYEY SILT and 4.04 F O SAND, some gravel; grey (TILL); 4.04
E cohesive, w <pl, hard<="" td=""></pl,>
Sand
7 SS 80
7 Sand and Screen
8 NOTES
2.3 m during drilling.
2. Groundwater level was measured at a denth of 5.3 mbrs (FL 208 5m) after well
9 installation.
3. Groundwater level was measured in monitoring well at 2.4 mbgs (FL 211 5m)
on January 29, 2021.

LOCATION: N 4862226.60; E 632859.96

RECORD OF BOREHOLE: S5 BORING DATE: January 12, 2021

SHEET 1 OF 1

DATUM: Geodetic

SF	PT/E	DCP	T HAMMER: MASS, 64kg; DROP, 760mm								HAMME	ER TYPE: AUTOMATIC	
щ	4	p	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION Y RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVI k, cm/s	Y, T		
DEPTH SCAI METRES		BURING MELF	DESCRIPTION	TRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	20 40 60 80 SHEAR STRENGTH nat V. + Q - (Cu, kPa rem V. \oplus U - (10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ WATER CONTENT PE Wp		STANDPIPE INSTALLATIO	≺ :)N
		_	GROUND SURFACE	0	215 70			-			40		
- 0	F		ASPHALT (200 mm thick)		0.00								
-			Crushed granular; brown FILL - (SP) SAND, some gravel, trace		0.20 215.23 0.47 215.02	1A 1B	AS	-				50 mm Dia. PVC Monitoring Well	
- - 1 -			FILL - (CI) sandy SILTY CLAY, some gravel; brown; cohesive, w>PL, stiff to very stiff		0.68	2	ss	14					
- - - -						3	SS	16		0			
2 2 			(CL-ML) SILTY CLAY-CLAYEY SILT and SAND, some gravel; brown to grey (TILL); cohesive, w <pl, hard<="" td=""><td></td><td>213.57 2.13</td><td></td><td></td><td>86/</td><td></td><td></td><td></td><td></td><td>-</td></pl,>		213.57 2.13			86/					-
- - - - - 3						4	55	0.23				Bentonite	
- - - -	2	m Augers				5	SS	50/ 0.13		0			
- - 4	Fruck Mount B5	D. Hollow Ster											
-		200 mm C				6	SS	50/ 0.15					
- 5 - 5 													
- - - -			- Becoming grey at a depth of 5.5 m									Sand	8.X-
						7	SS	50/ 0.1		0			
- - - 7 -												January 29,2021	
-					207.85	8	SS	50/					
- - 8 -		-	END OF BOREHOLE NOTES:	216122	7.85			0.00				Ľ	-
-			Borehole was open and dry upon completion of drilling. Groundwater level was measured in manifering well at a depth of 6.9 mbas										
- 9 - 9 -			(El.208.9m) on January 29, 2021.										-
-													
- 10													-
DE	I EPT	нs	CALE	1	I				GOLDER		11	LOGGED: YS	
1:	50											CHECKED: TO	

LOCATION: N 4862442.27; E 632817.44

RECORD OF BOREHOLE: S6 BORING DATE: January 12, 2021

SHEET 1 OF 1

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HAMMER TYPE: AUTOMATIC DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 40 NUMBER STANDPIPE ELEV. ТҮРЕ SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -0^W WpH - wi (m) 40 60 80 10 20 30 40 GROUND SURFACE 221.40 C ASPHALT (255 mm thick) 0.00 221.14 FILL - (SP) SAND, some gravel, trace fines; brown; moist 0.26 AS 1 220.65 FILL - (CI) sandy SILTY CLAY, some 0.75 gravel; dark brown; cohesive, w~PL, stiff 2 SS 10 220.03 (ML) SILT and SAND, brown; 1.37 non-cohesive, moist to wet, compact to dense SS 18 ΜН 3 2 SS 4 32 3 S:/CLIENTS/REGION OF YORKIMAJOR MACKENZIE DRIVE/02 DATA/GINTIMARKHAM WARDEN&KENNEDY RD.GPJ GAL-MIS.GDT 3/23/21 5 SS 49 d Stem Truck Mount B57 Hollow 217.36 4 (CL-ML) SILTY CLAY-CLAYEY SILT and SAND, some gravel; grey (TILL); cohesive, w<PL, hard Ö E C 50 6 SS 57 5 Auger grinding between depths of 5.5 m and 5.8 m 6 SS 7 96 0 7 SS 50/ 8 213.53 END OF BOREHOLE 7.87 8 NOTES: 1. Water measured in open borehole at a depth of 2.7 m upon completion of drilling. 9 10 GTA-BHS 001 DEPTH SCALE GOLDER LOGGED: YS 1:50 CHECKED: TO

LOG OF DRILLING OPERATIONS BG-MW1



R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

Page 1 of 1

Clie	nt:	Berczy Glen Landown	ers Group		Project Name:	Bercz	y Glen L	and	5		Logged b	y:	C. Di	nules	scu		
Proj	ect N	lo.: 300033248			Location: Mai	kham,	ON				Ground (I	m ams	sl):	220.2	2		
Drill	ing C	Co.: Lantech Drilling S	ervices Inc	c.	Date Started:	9/18/2	013				Static Wa	ater Le	evel [Depth	n (m):		
Drill	ing N	lethod: Hollow Stem	Auger		Date Completed	: 9/1	8/2013				Sand Pac	<u>sk Dep</u>	oth (n	n):4	.57 -	6.86	
	5 +b								Α				SAN	IPLE		Do	alb
	ale	Stratig	raphic Des	scription	1	trat Plot	Depth					Ë	be	نہ	/al.	Sc	pm ale
(ft)	(m)	Surface Elevation /m	۰ ۱۰		20	0 -	(m)			14141414		- P	l →	<u> </u>	ź	(#+)	(m)
	/	TOPSOIL - dark b	<u>.</u> rown loar	<u></u> m	.20	- Har		- E.C.						$\overline{7}$		<u>(1)</u>	<u>(11)</u>
			sand tra	no fino	subrounded		- 0,35						SS	IX.	24		
		aravel, pockets of f	ine to me	edium o	rained	<u> </u>											Ē
	- 1.0	sand, damp, weakl	y plastic,	lught b	prown, soft,	×	-					1	55	\mathbb{N}	21		- 1.0
		iron staining				×							00	\square			Í
5.0-	-	SANDY SILT - trac	o clav, tr	aco fina	aravol light	× · ×	 1.57							7		5.0-	-
	-20	brown, weakly plas	stic. soft. (damp	e giavei, ligin	××·×						2	55	IX.	24		L20
	2.0					<u> </u>	2.21	-		.						_	-2.0
		SAND - very line to occasional gravel	o fine grai uniform	liaht hr	race siit, own damn					bentor	nte seal		99	\mathbb{N}	82/10*		-
		to wet, loose.	annonn, i	ngin bi	omi, damp		-					Ľ		\square	0210		
10.0-	- 3,0													7		10.0 —	- 3,0
	_											4	SS	IX.	55/6"		L
							+							\vdash		_	
	- 4,0							Ŧ									-4,0
15.0						····	. 470									15.0 -	-
44	- 5,0	SANDY GRAVEL -	trace cla	ay, trac	e silt, well	. ·o. ·	4.70			∵∣ ∙ isilica s	and pack	5	SS	\ge	105		- 5,0
1/28		graded, wet to said	nateo, io	ose, m	e to large.	0. a	-			· ·							
lag						o o			· E								-
ATE		SAND - medium to	very coa	arse gra	ained, trace		5,64										
a 20.0-	- 6,0	line gravel, trace si	lit, unifor rell grade	m, ligni d	t brown,	<u> </u>			÷			6	SS	\geq	77	20.0 -	-6.0
11	-	SANDY GRAVEL -	fine to c	oarse o	rained		6.45	-	. 🗄	·		7	58	\bowtie			-
EN.G		subangular to subr	ounded, i	trace s	ilt, trace clay,	<u> </u>	6.96			·.		8		$ \sim$		_	
≺GL		cobbles, saturated	, loose				0.00		0.00								
RCZ		SAND - fine to coa	rse grain	ed, trac	ce silt, trace												
28 BE		and boulders	ni brown,	, satura	lied, cobbles												
0033(
N/30		Stone refusal at 6.8	86 m														
GLE																	
30Z																	
19 8 8																	
3324																	
000																	
)BSK																	
9																	
21S/3																	
	nara	ad By: S Charity			Checked By		Jinulee				Data I	Prons	arad	1	0/7/9	012	
	s bor	ehole log was prepared	d for hydro	ogeologi	cal and/or envi	ronmer	ital purp	oses	anc	l does n	ot necessar	ily co	ntain	info	matic	o 13 5n	
ਿ suit	table	for a geotechnical asso tes Limited personnel b	essment o	of the su	bsurface condi	tions. E	Borehole	e dat	a rec	quires in	terpretation	by R.	J. B	urns	ide &		
						-						 _					
	END		MONITOR	ING WE	LL DATA	<u></u>	AMPLE 1	IYPE	AC		Auger Cutting	g S	sĿ≥		Split	Spoc	'n
<u>ର</u> 🕺	wate	r round @ time of drilling	Pipe:	51 mm (dia. PVC				CS		Continuous	A	RLL		Air R	otary	č.
뛰 수	Statio	c Water Level -	Screen:	51 mm (dia. PVC #10 slo	t			RC	^ ^ ^	Rock Core	W	rcĽ	`	Wash	n Cut	tings

BURNSIDE

R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

LOG OF DRILLING OPERATIONS <u>AG-MW12</u>

Page 1 of 1

Client:	Angus Glen Developme	nts Inc.	Project Name:	Angus	Glen M	ESP	,		Logged by	/: (C. D.	<u> </u>			
Project	No.: 300034937		Location: Mark	kham,	ON				Ground (m	n ams	sl):	217.2	20		
Drilling	Co.: Lantech Drilling Sei	vices Inc.	Date Started: 2	2/25/20	15				Static Wat	er Le	evel [Depth	(m):	3.46	;
Drilling	Method: Hollow Stem Au	uger	Date Completed:	2/2	5/2015				Sand Pac	k Dep	oth (r	n) : 5	.46 - 7	7.62	
Depth Scale	Stratigra	phic Descriptio	n	Strat. Plot	Elev. Depth					m	SAN ed	IPLE ਦ	.Val.	Dep Sca	oth ale
(ft) (m)) Surface Elevation (m):	21	7.20		(m)					z	Ĥ		z	(ft)	(m)
	TOPSOIL Dark brown sandy si of rocks, dry	lt, weathered	small pieces							1	SS	X	frozen	-	
- 1.0					215.76					2	SS	A	29	5.0	- 1.0
- 2.0	FILL Gravel and Sand, fra compact, dry, trace s	igments of roo	cks, loose to							3	SS	X	>100	5.0	- 2.0
10.0 - 3.0								Holeplu	g	4	ss	X	>50/3"	10.0	- 3.0
	Condy Cit Till				<u>213.47</u> 3.73	$\underline{\nabla}$				5	ss	X	>50/4"		-
- 4.0	Grey, stiff, dry, some diameter) subangula	clay, trace g r to subround	ravel (<2 cm ed,							6	ss	X	>50/2"	15.0 -	- 4.0
- 5.0	becomes harder with	n depth	and							7	ss	Х	>50/4"	_	- 5.0
- 105 - 20.0 - 6.0														20.0 -	- 6.0
								Sandpa	ck	8	SS	X	>50/5"	_	
- 7.0					209.58			vveii Sci	reen						- 7.0
5 25.0 -					7.62		7.62			9	SS	\mathbf{n}	>50/4"	25.0 -	
003493															
EN/300															
sus gr															
DANG															
37.000															
00349(
BS/30															
300 JC															
ECTSK															
Prepar	red By: C. D.		Checked By:	J. S.					Date P	repa	red:	7/	26/2	015	
L I his bo suitable Associa	renole log was prepared f e for a geotechnical asses ates Limited personnel bef	or hydrogeolog sment of the su ore use by othe	ical and/or envirol bsurface conditioners.	nmenta ns. Bo	n purpos rehole c	ses lata	and d requi	oes not i res inter	necessarily pretation by	conta R. J	ain ir . Bur	nside	ation 8 &		
		IONITORING WI	ELL DATA	SA	MPLE T	YPE	AC	A	uger Cutting	SS	s 🖸		Split S	Spoor	า
ö ▼ Wate	er found @ time of drilling P	ipe: 51 mm	dia. PVC				cs [<u>))</u> C	ontinuous	AF	ע ד	Щ,	Air Ro	otary	
ਜ਼ੋ∣⊥∕ Stat	tic Water Level - 6/16/2015 S	creen: 51 mm	dia. PVC #10 slot				RC	^^^^ R	ock Core	W	cĽ	Ù	Wash	Cutti	ngs

	Lo	g of	ľ	Bore	h	ole 113				
Project No.	BRM-00609175-AO	•						Drawing No.		16
Project:	Geotechnical Investigation	- Bercz	zy	Warden	S	ubdivision		Sheet No.	1	of _2
Location:	10206 and 10348 Warden	Avenue	e, I	Markhan	ı,	Ontario				
Date Drilled: Drill Type: Datum:	May 19 and 22, 2020 Dietrich 120 Geodetic			Auger Sample SPT (N) Value Dynamic Cone Shelby Tube Field Vane Te	e Te st		Combustib Natural Mo Plastic and Undrained % Strain a Penetrome	ble Vapour Reading bisture d Liquid Limit H Triaxial at t Failure eter	⊂ × ⊕] (Ə
			_			5				
G X W B L O L	Soil Description	ELEV. m	D E P T H	20 Shear Streng	 th	N Value 10 60 80 MPa	Combustible 250 Natural Atterberg	e Vapour Reading (ppr 500 750 Moisture Content % Limits (% Dry Weight) 20 30	n) SAMPLES	Natura Unit Weight kN/m ³
	SOIL - 400mm dark brown silt	214.40	0	8						
SILT grave to ve	Y CLAY - some sand, trace of el; brown, moist to saturated, stiff ry stiff		1	ó				× *		19.70
		212.4		14 Ŏ				×		20.20
SILT	- brown, saturated, compact	212.0	2		22]
SANI scatte satur dens	DY SILT TILL - wet sand seams, ered gravel and cobbles; brown, ated becoming moist at ~3m, e to very dense		3		Ĵ.	60/50mm	×			
- bec	coming grey	-	4			60/Z5mm				
		-	5							
		_	6			60/100mm	×			23.20
			7							
		_	8			60/100mm	×			23.60
			9			60/125mm				
			10			Φ				23.40
		_				60/125mm				23.20

Continued Next Page

[%] exp.

Time	Water Level (m)	Depth to Cave (m)
On completion After 4 hours After 5 days	3.96 0.61 0.58	Borehole Well Well

		Lo	g of	ŀ	B	01	re	h	ole	e	1	13						
Pr	oject	No. <u>BRM-00609175-A</u> O												Drav	wing N	lo		16
Pr	oject	Geotechnical Investigation	- Bercz	y	W	arc	len	S	ubdiv	visio	n			S	heet N	lo	2	of <u>2</u>
G W L	SYMBOL	Soil Description	ELEV. m 203.40	DUPTH 1	S	hear	20 Strer	4 igth 0	N Value 0 (9 60	80	MPa 2	Combus 25 Nati Atterb	tible Vapo 50 50 ural Moistu erg Limits 0 2	our Read 00 7 ure Conte (% Dry \ 0	ng (ppm) 750 ent % Veight) 30) SAMPLES	Natural Unit Weight kN/m ³
			-															
			201.9	12	2			5	i0/150mi	m			×					23.30
		END OF BOREHOLE NOTES: 1. Groundwater monitoring well installed to 11.89m; sealed with bentonite from 0.3 to 8.23m.																
1/20																		
JEW.GDT 6/24																		
1175AO.GPJ 1																		
02 BRM00609																		
LAGWGL																		

*exp.

Timo	Water	Depth to
TITLE	(m)	(m)
On completion	3.96	Borehole
After 4 hours	0.61	Well
After 5 days	0.58	Well

		Lo	g of	ŀ	Boreho	ole	113	A				
Proje	ct No.	BRM-00609175-AO	0						Drawing No) .		17
Proje	ect:	Geotechnical Investigation	- Bercz	zy '	Warden Sul	bdivisio	n		Sheet No	o. 1	(of 1
Locat	tion:	10206 and 10348 Warden	Avenue	, I	Markham, C	Intario						
Dete	Drille di	May 22, 2020		_	Auger Sample	mano		Combus	stible Vapour Read	ling		
Date	Drillea.	Nay 22, 2020		_	SPT (N) Value	0	\square	Plastic a	and Liquid Limit	⊢	$\stackrel{\boldsymbol{}}{\leftarrow}$	\mathbf{D}
Drill	l ype:			-	Shelby Tube			Undrain % Strair	ed Triaxial at n at Failure	€	€	
Datu	m:	Geodetic		-	Field Vane Test		S	Penetro	meter	4	•	
s	3			П	N	Value		Combust	tible Vapour Readin	g (ppm)	S	Natural
G Y W B L C L	1 3)	Soil Description	ELEV. m 214.40	DEPTH	20 40 Shear Strength 0.1	60	80 MPa 0.2	25 Natu Atterbe	0 500 75 ral Moisture Conter erg Limits (% Dry W) 20 3	50 ht % eight) 0	- MP-LES	Unit Weight kN/m ³
		SOIL - 400mm dark brown silt	214.0	ľ								
	- SILT grave to ve SILT SAN scatu dens - bee	Y CLAY - some sand, trace of el; brown, moist to saturated, stiff ery stiff - brown, saturated, compact DY SILT TILL - wet sand seams, tered gravel and cobbles; brown, rated becoming moist at ~3m, te to very dense	212.4	1 2 3 4 5 6								
			207.2	7								
AGWGL02 BRM00609175AO.GPJ NEW.GDT 6/24/20	NOT 1. Gr ins be	END OF BOREHOLE ES: roundwater monitoring well stalled to 7.19m; sealed with entonite from 0.3 to 3.53m.										



Time	Water Level (m)	Depth to Cave (m)
On completion After 4 hours After 5 days	Drý 1.14 1.09	Borehole Well Well

				Lo	g of	F	301	reł	nole	116					
I	Pro	oject	No.	BRM-00609175-AO								Drawing No.		20	1
I	Pro	oject	:	Geotechnical Investigation	1 - Bercz	zy	Ward	len S	Subdivis	sion		Sheet No.	1	of	1
I	Loc	catio	n:	10206 and 10348 Warden	Avenue	e, I	Markl	ham,	, Ontari	0					
1	Da [:] Dri Da [:]	te Di II Ty _l tum:	rilled: pe:	May 13, 2020 Dietrich 120 Geodetic			Auger S SPT (N) Dynamic Shelby 1 Field Va	ample Value c Cone ⊺ ſube ne Test	Test		Combus Natural N Plastic a Undraine % Strain Penetror	tible Vapour Reading Moisture nd Liquid Limit H ad Triaxial at at Failure neter	€ ⊕	□ < ⊖	
	G W L	SYMBOL		Soil Description	ELEV. m 213.76	DUPTH	Shear	20 Strength	N Value 40 60 0.1	80 MPa 0.2	Combusti 250 Natur Atterber 10	ble Vapour Reading (pp 500750 al Moisture Content % rg Limits (% Dry Weight) 2030	n) SAN		atural Unit /eight N/m ³
			TOP:	SOIL - 300mm dark brown sandy	213.5	0	5								
			-SAN	DY SILT - brown, saturated,	/213.1							*			
				Y CLAY - brown, moist, very stiff	/	1			_			- × -			
														2	
			_ - ber	coming grev			0 O					×			
i			bet	conning grey	_	2								4	
			_		_		– 12 Ŏ					- × -			
:			CAN		210.9	2								4	
			and o	cobbles; grey, moist with wet sand		3				81/250mm	×		Į		
		$\langle \rangle \rangle$	_seam	ns, very dense	-									4	
			_		_	4									
[.					-				60/100	imm	×		Z		
					_	5									
					_										
			_		207.5	6			60/50	mm	×				
			NOT	END OF BOREHOLE ES:											
			1. Gr ins	oundwater monitoring well stalled to 5.84m: sealed with											
			be	ntonite from 0.3 to 2.18m.											
24/20															
DT 6/															
EW.G															
N Ld															
5AO.6															
30917															
3M006															
02 BF															
3WGL															
LAC															



Time	Water Level (m)	Depth to Cave (m)
On completion	Drý	Borehole
After 9 days	0.97	Well
After 14 days	0.99	Well

PROJECT: 14-1186-0012 LOCATION: See Figure 2

DEPTH SCALE METRES

RECORD OF BOREHOLE: 14-16

BORING DATE: May 8, 2014

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP. 760mm

SPT	/DCP	T HAMMER: MASS, 64kg; DROP, 760mm																	HAM	MER	₹ TY	PE: AUTOMATIC	;
	0	SOIL PROFILE			SA	MPL	ES	DYNAMI RESISTA		BLOW	FION S/0.3m	n)	HYDRA	ULIC k. cm	CON	IDUCT	IVITY,	-	т Ц	U		
LCS.	AETH		101		r		3m	20		40	60	8	0	10	-6	10-5	10	J ⁻⁴ 1	0-3		STIN	PIEZOMETH OR	ER
MEIT	NG	DESCRIPTION	TAP	ELEV.	MBE	YPE	VS/0	SHEAR S	STRE	NGTH	nat V	· +	Q- •	WA	ATER	CON	TENT	PERCE	NT	E	B.T	STANDPIP INSTALLAT	'E ION
	BOR		TRA	(m)	N		BLOV	Cu, KFa		10	iem v	v. ⊕	0-0	Wp	<u>н</u>		-0W		WI	AL	P		
+		GROUND SURFACE	0		\vdash			20		40	60	8	0	10)	20	3	0 2	<u>,0</u>		+		
0		FILL - (ML) CLAYEY SILT, some sand,		214.70		-				+									-	+	+	0	
		organic inclusions; dark brown; cohesive, W <pl firm<="" td="" to="" w~pl,=""><td></td><td></td><td>1</td><td>SS</td><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td><td>ľ</td><td>Concrete</td><td></td></pl>			1	SS	5										0				ľ	Concrete	
		(ML) sandy CLAYEY SILT: pale brown.		214.01		1																	
1		with oxidation staining; cohesive, W <pl,< td=""><td></td><td></td><td>2</td><td>SS</td><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></pl,<>			2	SS	9									0							
1		Sun			Ĺ																		
		(CI) SILTY CLAY, some sand: gray, with		213.33																			
		oxidation staining; cohesive, W>PL, firm				-																	
					3	SS	7									+		-0-	1	PL	2		
2		1																					
		Very thinly bedded with fine sand below			\vdash																		
		existing ground surface			4	SS	12									0							
		1																					
		(ML) sandy SILT some clay to clayey		211.80																			
°		trace gravel, with pockets of medium																					
		very dense	A A		5	SS	83							0								ł	
			A A A	1	-																	l l	
			200	1																		Σ	7
4			AN																				
		1	A A																				
	55	1	0 0																				
	CME	1			6	SS	50/							0									
	n Aug	1	A A A	:																			
5	NOUN v Ster		200	1																		Bentonite Seal	
	ACK N Hollon	1	200	1																			
	TR		4.4.4																			l l	
			Q . 4 . 4																			l l	
6		1	0.0																				
		1	Q 4 2		7	SS	50/							0									
		1	A A		\vdash	-	.13																
			A V A																				
		1	A N N																				
7		1	AN																				
		1	44																				
			4 4																				
		1	A A		8	SS	50/							0									
8			A A A		<u> </u>		.00																
°		1	A A A																				
			0 4 4																				
		1		1																			
			20.0	1																		1	
9			44.4																				
		1	9 9	4 1	9	SS	50/							0								1	

P

Golder Associates

4 4 4

CONTINUED NEXT PAGE

GTA-BHS 001 S:\CLIENTS\STONYBROOK\BERCZY_CREEK\02_DATA\GINT\1411860012.GPJ_GAL-MIS.GDT_10/6/17

10

1:50

DEPTH SCALE

CHECKED: AM

LOGGED: JG

PROJECT: 14-1186-0012 LOCATION: See Figure 2

RECORD OF BOREHOLE: 14-16

BORING DATE: May 8, 2014

SHEET 2 OF 2 DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

1 I I		SOIL PROFILE			SA	MPL	ES	RESISTANCE, BLO	TION /S/0.3m	ì	HYDRAU k	JLIC CON , cm/s	NDUCT	IVITY,	T	10	
METRES		DESCRIPTION	RATA PLOT	ELEV. DEPTH	NUMBER	TYPE	OWS/0.3m	20 40 SHEAR STRENGTH Cu, kPa	60 € nat V. + rem V. ⊕	Q - ● U - ○	10 ⁻⁶ WA ⁻ Wp I	10 ⁻⁵) ⁴ 1(PERCEN)³ ⊥ NT MI	ADDITIONAL LAB. TESTIN	OR STANDPIPE INSTALLATION
10		CONTINUED FROM PREVIOUS PAGE (ML) sandy SILT, some clay to clayey, trace gravel, with pockets of medium sand; grey (TILL); non-cohesive, moist, very dense	ST 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		10	SS	50/ .13	20 40	60 8	30	0	20	3	0 4	0		Bentonite Seal
12 TRACK MOUNTED CME 55 LUARDAN ALLANDAN	HOIIOW STERN AUGERS	Becoming more moist below a depth of approximately 13.1 m below ground surface	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		11	SS	50/ .13				0						
14		Augers grinding below a depth of approximately 14.9 m below ground surface. Inferred cobble/boulder AUGER REFUSAL ON INFERRED COBBLE (POLITINE	A P A P A P A P A P A P A P A P A P A P	199.16 15.54	12	SS	.13 50/ .13				0						Silica Sand Filter
16		END OF BOREHOLE															measured at a depth 3.87 m below ground surface, June 20/14
18																	
19																	

SP	T/DC	CPT HAMMER: MASS, 64kg; DROP, 760mm				_		HAMMER	YPE: AUTOMATIC
	ООН	SOIL PROFILE		5	AMP	LES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		PIEZOMETER
METRES	BORING MET	DESCRIPTION	STRATA PLOT	LEV. EPTH (m)	TYPE	BLOWS/0.3m	20 40 60 80 10 ⁶ 10 ⁵ 10 ⁴ 10 ⁷ SHEAR STRENGTH Cu, kPa nat V. + Q. ● rem V. ⊕ U. ○ WATER CONTENT PERCENT Wp I ─ OW I W WATER CONTENT PERCENT Wp I ─ OW I W 20 40 60 80 10 20 30 40		OR STANDPIPE INSTALLATION
0	-	GROUND SURFACE		220 20	-	-			
		rrace rootlets, trace gravel; brown; cohesive, w <pl, stiff<="" td=""><td></td><td>219.59</td><td>SS</td><td>12</td><td>0</td><td></td><td></td></pl,>		219.59	SS	12	0		
1		FILL - (CL) SILTY CLAY, trace gravel, some sand; brown; oxidation staining; cohesive, w <pl, firm<="" td=""><td></td><td>0.61</td><td>ss</td><td>7</td><td>o</td><td></td><td></td></pl,>		0.61	ss	7	o		
2		(ML) sandy SILT, trace gravel, brown; oxidation staining; non-cohesive, moist to wet, compact to very dense		1,37	ss	21	φ		
				4	ss	69	о		
3		subort		4	ss	73	o	МН	
4	Mobile B-45	(SP) SAND, some gravel; brown;		e 214.54 5.56	ss -	57	o		
6 7				1	ss	40	φ		
8			A LINE AND	2	ss	50/ 0.05	0		
9		(SM) gravely SILTY SAND; grey (TILL), contains cobbles and boulders; non-cohesive, moist, very dense		211.60) ss	50/ 0.08	o		
10	_L			210.24	+-		┝╼┼╼┝╼┼╾╞╼╂╼╞╼┼╼┾╸		

PROJECT: 19119989 (2000) LOCATION: See Figure 1

RECORD OF BOREHOLE: 20-12

BORING DATE: July 10, 2020

SHEET 2 OF 2

DATUM: Geodetic

01 1/001	PT HAWIWER: MASS, 64Kg; DROP, 760mm	1					HAN	IMER TYPE: AUTOMATIC
S ALE	SOIL PROFILE		SA	MPLES	DYNAMIC PENETRA RESISTANCE, BLOW	TION /S/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	
DEPTH SC METRES BORING ME	DESCRIPTION	STRATA PLO		TYPE BLOWS/03m	20 40 SHEAR STRENGTH Cu, kPa 20 40	60 80 nat V. + Q● rem V. ⊕ U O 60 80	10 ⁶ 10 ⁵ 10 ⁴ 10 ³ WATER CONTENT PERCENT Wp I Wi 10 20 30 40	
- 11 - 12 - 13 - 14	- CONTINUED FROM PREVIOUS PAGE - ((CL-ML) CLAYEY SILT and SAND, some gravel; grey (TILL), contains cobbles and boulders; cohesive, w <pl, hard</pl, 		\$.96 10 11 11	SS 50 0.0	20 40	0 80	0	
- 15 			13	SS 01			•	
17 18 19 20	END OF BOREHOLE NOTE: 1. Borehole open upon completion of drilling. 2. Heaving sand encountered at a depth of 7.6 m, drilling method changed to 110 mm tricone with mud.		16.09	0.3				
DEPTH S	CALE	<u> </u>						LOGGED: MJB/BD

PROJECT:	19119989 (2000)
LOCATION:	See Figure 1

RECORD OF BOREHOLE: 20-13

BORING DATE: July 20, 2020

SHEET 1 OF 2

DATUM: Geodetic

SP	T/DC	CPT HAMMER: MASS, 64kg; DROP, 760mm								HAMMER TYPE: AUTOMATIC					
щ	8	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	T 79	PIEZOMETER				
SCAL	METH		LOT		R		3m	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 1		OR STANDPIPE				
MET	SING	DESCRIPTION	ATAF	DEPTH	UMBE	TYPE	WS/C	SHEAR STRENGTH nat V + Q - Cu, kPa rem V ⊕ U -			INSTALLATION				
ä	BOR		STR	(m)	z		BLG	20 40 60 80	10 20 30	40					
- 0		GROUND SURFACE		218.30											
		TOPSOIL (690 mm)		0,00											
					1	55	°								
3		(CL) SILTY CLAY trace sand to sandy		217,61											
1		trace gravel; brown, organic staining,			2	ss	10		0		9				
					3	ss	12		0						
. ,															
4		(SM) SILTY SAND, some gravel; brown	I	216.17											
		to grey (TILL), contains cobbles and boulders; non-cohesive, moist, dense to	H	1	4	55	31								
		very dense	H	1	Ľ										
		SW SIG	H	1											
3			H	1											
		- Becoming grey at a depth of 3.4 m	田	1	Ĵ	33	13								
	1	220 1	H	1											
			H								9				
1			州												
				1											
	e B-45				\vdash		07/								
					6	SS	0.2		°						
- 5	Mobile														
			開												
		- Auger grinding between depths of 5.5 m and 6.1 m													
			H												
- 6	╎┝	-	H		7	ss	50/ 0.1		р	мн					
			H												
			1												
7			相												
			招	1											
		Mud			8	ss	50/		0						
		e with	招				0.13				,				
- 8		Tricon													
	[u o	1												
		F													
- 9					9	ss	50/		0						
					Γ		0.08								
- 10	F٦	CONTINUED NEXT PAGE	120				-								
	ļ]	1	L		1	-								
DE	PTH	SCALE								l	OGGED: BD				
1:	50									C	HEGRED. KN				

	PF		T: 19119989 (2000)	REC	ORD	SHEET 2 OF 2				
	LU	JUATI	JN: See Figure 1		BOR	ING DATE: July 20, 2020		DATUM: Geodetic		
	SP	T/DCF	PT HAMMER: MASS, 64kg; DROP, 760mm				HA	MMER TYPE: AUTOMATIC		
	DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE	W (m)	SAMPLES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 SHEAR STRENGTH nat V. + Q. • Cu, KPa rem V. + Q. •	HYDRAULIC CONDUCTIVITY, k, cm/s 10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³ WATER CONTENT PERCENT WP	PIEZOMETER OR ILLI STANDPIPE INSTALLATION		
t	- 10		- CONTINUED FROM PREVIOUS PAGE -	ω		20 40 60 80				
GINTBERCZYGLEN MARKHAM GPJ GALMIS GDT 6/25/21	- 10 - 11 - 12 - 13 - 14 - 15 - 16	Mobile B45 110 mm Tricene with Mud	CONTINUED FROM PREVIOUS PAGE — (SM) SILTY SAND, some gravel; brown to grey (TILL), contains cobbles and boulders; non-cohesive, moist, dense to very dense - Auger grinding between depths of 12.2 m and 13.1 m		z SS 50/ SS 50/ SS 50/ SS 50/ 0.13					
001 S/CLIENTSISCS CONSULTINGIBERCZYGLEN MARKHAM/02 DATAI	- 17 - 18 - 19 - 20		END OF BOREHOLE NOTE: 1. Borehole open upon completion of drilling.	20126 1	4 SS 50/ 0.13		о 			
GTA-BHS	DE 1 : 1	РТН S 50	CALE					LOGGED: BD CHECKED: KN		

PRO	CATIC	CT: 19119989 (2000) ON: N 4861885.83; E 632932.01		ĸ	.0	B	SOR	NG DATE: May 10, 2021	21-1	D	ATUM: Geodetic
SPT	7DCI	PT HAMMER: MASS, 64kg; DROP, 760mm							НАМ	VER T	YPE: AUTOMATIC
METRES	BORING METHOD	SOIL PROFILE	STRATA PLOT	ELEV DEPTH (m)	NUMBER	MPL	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 4 20 40 60 80 SHEAR STRENGTH Cu, kPa nat V. + Q. • rem V. ⊕ Q. • U. O	HYDRAULIC CONDUCTIVITY, k, cm/s Image: 10^{4} m/s^{3} Image: 10^{4} m/s^{3} </td <td>ADDITIONAL LAB TESTING</td> <td>PIEZOMETER OR STANDPIPE INSTALLATION</td>	ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		216.45							50 mm Diameter
°		ASPHALT (150 mm)		0.00							PVC Monitornig Well (Flush mount)
		non-cohesive, moist, dense		215.69	1	ss	30		0		
1		Cohesive, w~PL, firm		0.70	2	SS	8		0		
	2				3	ss	6		o		
2	It Mobile B57	(CL) sandy SILTY CLAY to SILTY CLAY and SAND, some gravel; brown to grey at 6.1 m (TILL), contains cobbles and boulders; cohesive, w <pl, stiff="" td="" to<="" very=""><td></td><td>214.32 2.13</td><td>4</td><td>ss</td><td>17</td><td></td><td>p</td><td></td><td></td></pl,>		214.32 2.13	4	ss	17		p		
3	Track Mour 30 mm O. D. Hol	hard									
	2				5	SS	20		þ		
4											
5		-			6	SS	50/ 0.13		0		Bentonite
6											
7					7	SS	93/ 0.23		þ		
	Track Mount Mobile 857 0 mm Tricone Mud Rotar				8	ss	83		с⊨—	мн	
	13										
9					9	ss	50/ 0.13		0		
10		CONTINUED NEXT PAGE				-	-		+		
DEF	этн	SCALE						GOLDER		L	OGGED: YS

PROJECT:	19119989 (2000)
LOCATION:	N 4861885 83; E 632932.01

RECORD OF BOREHOLE: 21-1

BORING DATE: May 10, 2021

SHEET 2 OF 2

DATUM: Geodetic

5P	1/0		TRAVIMER: MASS, 64kg; DROP, 760mm			_				HA	MMER	TYPE: AUTOMATIC
LI L	UCH.		SOIL PROFILE	1.		SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	T ju	PIEZOMETER
ETRES	O MET		DECODICTION	V PLOT	ELEV.	BER	ц Ц	3/0.3m	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³		OR
Σ	NINOR		DESCRIPTION	TRAT	DEPTH (m)	NNN	Ϋ́	NO	Cu, kPa rem V. 🕀 U - O		ADDI	
_	-	+		io			-		20 40 60 80	10 20 30 40	-	
10			(CL) sandy SILTY CLAY to SILTY CLAY and SAND, some gravel; brown to grey									
			at 6.1 m (TILL), contains cobbles and boulders; cohesive, w <pl, stiff="" td="" to<="" very=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td></pl,>								1	
			hard			-		50/				
11						10	55	0.07		0		
												Bentonite
12												
						11	ss	50/ 0.07		0		
13		ž				12	SS	50/		0		
	bile 85	ud Rota						0.13		Ĭ		
	ount Mo	cone M										Sand
	rack Me	m Tr						100/				
14		5				13	ss	0.25			MH	
						14	ss	50/ 0.07		0		
15												
						_						Screen
						15	ss	52		0		国
												1
16												
17					199.41	16	ss	50/ 0.13		0		Sand
			END OF BOREHOLE		17.04							
			1. Water encountered at a depth of									
			4.6 m during drilling.									
18			Water level measured in monitoring well as follows:									
			Date Depth (m) Elev. (m) 20-May-21 0.6 215.9									
			,									
19												
20												
						_	1					
DEI	PTF	I SC	CALE						GOLDER		ι	OGGED: YS
1:4	50								MEMOLY OF WEP		CI	HECKED: YS

PROJECT:	19119989 (2000)
LOCATION:	N 4861617 47; E 632979 74

RECORD OF BOREHOLE: 21-2

BORING DATE: May 7, 2021

SHEET 1 OF 2

DATUM: Geodetic

SF	РΤ/	DCP	T HAMMER: MASS, 64kg; DROP, 760mm							HA	MMER 1	YPE: AUTOMATIC
щ	Т	8	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	چړ	PIEZOMETER
DEPTH SCAL METRES		ORING METH	DESCRIPTION	FRATA PLOT		NUMBER	TYPE	LOWS/0.3m	20 40 60 80 SHEAR STRENGTH nat V + Q - € Cu, kPa rem V ⊕ U - 0	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³ WATER CONTENT PERCENT Wp I	ADDITIONA LAB. TESTIA	OR STANDPIPE INSTALLATION
- 0		E T	GROUND SURFACE TOPSOIL (100 mm)	ST ST	(m) 220.80 0.00			BI	20 40 60 80			50 mm Diameter P3
	ack Mount Mobile B57	O.D. Hollow Stem Augers	FILL - (CL) sandy SILTY CLAY; brown, rootlets, organic inclusions; cohesive, w~PI, firm		0,10	1	ss ss	8		D D		Well (Flush mount)
2	Tra	200 mm			218 67	3	SS	4		þ		
			(SM) SILTY SAND; brown; non-cohesive, moist, very dense		2.13	4	SS	65		0		Bentonite
- 3 						5	SS	72		0		
• •			(SP) gravely SAND, some fines; brown; non-cohesive, wet, very dense		216.76 4.04							⊽5 5
5	ile 867	d Rotary				6	SS	61		0		May 20, 2021
6	Track Mount Mobi	130 mm Tricone Mu			213,75	7	SS	83/ 0.25		Φ	мн	Screen
			(CL) sandy SILTY CLAY, some gravel; grey (TILL), contains cobbles and boulders; cohesive, w <pl, hard<="" td=""><td></td><td>7.05</td><td>8</td><td>ss</td><td>50/ 0.10</td><td></td><td>0</td><td></td><td></td></pl,>		7.05	8	ss	50/ 0.10		0		
9						9	ss	50/ 0,10		c		
-			CONTINUED NEXT PAGE									
DI 1	EP' : 50	TH S	GCALE								i Ci	.ogged: SC Hecked: YS

PR	OJEC	T: 19119989 (2000)		
LO	CATIC	N: N 4861617 47; E 632979.74		
1				
SP	T/DCF	T HAMMER: MASS, 64kg; DROP, 760mm		
щ	Q	SOIL PROFILE		
DEPTH SCAL METRES	BORING METH	DESCRIPTION	STRATA PLOT	ī

Г

RECORD OF BOREHOLE: 21-2

BORING DATE: May 7, 2021

SHEET 2 OF 2

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

Ŀ	щ	SOIL PROFILE				SA	MPI	ES	DYNAMIC PENETRA RESISTANCE, BLOV	FION /S/0_3m	2	HYDR	AULIC C k, cm/s		IVITY,	Т	.0		
ġ	RES	H H			LoT		æ		an	20 40	60	80	1	0 ⁻⁰ 1	0.5 1	o ^{_4} 10	⊾	STIN	PIEZOMETER OR
Ē	METH			DESCRIPTION	TAP	ELEV.	MBEI	Å	VS/D	SHEAR STRENGTH	nat V. +	Q - 0	w	ATER C	ONTENT	PERCEN	π	DITIO TEC	
ł	5		ξ		TRA.	DEPTH (m)	Ī	I۴.	LQ	Cu, KPa	rem V. E	0-0	w w	p		i v	VI	A BA	INGTALLATION
┝	_	-	-		ίΩ.		-	-	—	20 40	60	80	1	0	20 3	0 40	>		
ŀ	10			- CONTINUED FROM PREVIOUS PAGE	1219	_		-	-		_	-	-		-				
F	1			grey (TILL), contains cobbles and															
F				boulders; cohesive, w <pl, hard<="" td=""><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></pl,>		1													
F	8				RB								Ľ						
È.							10	ss	50/ 0.15				C						
L	- 11				82	1													
Ľ.	1.117.0				64	1													
2					K.												- 1		
	2																		
2					РH														
	12				60														
	12												6						
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					49														
	13																		
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		le B5	Rotz		Иł		12	ss	50/				0					мн	
	14	Mobi	Mud																
		ount	icone																
		ck M	Ē																
		Ē	8		R.R		13	ss	50/ 0.08					þ					
			-								1								
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	16				84		15		50/						1 1				
							12	55	0.10										
					22			11			1								
							16		50/										
	17						10	33	.010										
	.,																		
							l li											- 1	
	18																		
	."																		
			4			202.42	17	SS	50/				0						
				END OF BOREHOLE		18,38							2670						
				NOTES:											1				
	10			1. Water encountered at a depth of															
	19			4.6 m during drilling.															
				2. Water level measured in monitoring															
				well as follows:				ľ (
				Date Depth (m) Elev (m) 20 May 21 4.7 216.1															
				20 mag=21 4.7 210,1							1								
	20										1								
			_																
	DEF	카	isc	CALE					Ň	🔿 GOLI	EP							10	GGED SC
	1:5	50								MEMBER OF	WBP							CU1	CKED: VS
										and the second s								10	

PROJECT:	19119989 (2000)
LOCATION:	N 4861620,43; E 633018.12

RECORD OF BOREHOLE: 21-3

BORING DATE: May 4, 2021

SHEET 1 OF 3

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm									HAMMER	TYPE: AUTOMATIC	
ω	8	SOIL PROFILE		s	AMPLE	S DYN RES	NAMIC PENETRATION SISTANCE, BLOWS/0,3m	~	HYDRAULIC CONDUCTIVITY, k, cm/s	T 7	PIEZOMETER
DEPTH SCAL METRES	BORING METH	DESCRIPTION	STRATA PLOT ETEA (E) (E)	NUMBER	TYPE	BLOWS/0.3m Cn' 1	20 40 60 EAR STRENGTH nat V 4 kPa rem V 6 20 40 60	80 + Q - Đ U - O 80	10 ⁶ 10 ⁵ 10 ⁴ 10 ³ WATER CONTENT PERCENT Wp		OR STANDPIPE INSTALLATION
		GROUND SURFACE	220	82							50 mm Diameter Di Di
		TOPSOIL (680 mm) (CL) SILTY CLAY and SAND, some gravel; brown; cohesive, w <pl, stiff<="" td=""><td>220 0</td><td>1 14 58 2</td><td>SS SS</td><td>6</td><td></td><td></td><td>0</td><td></td><td>PVC Monitornig Well (Flush mount)</td></pl,>	220 0	1 14 58 2	SS SS	6			0		PVC Monitornig Well (Flush mount)
- 2		(SM) SILTY SAND, trace gravel; brown (TILL); very dense	219	45 37 3	ss	50			φ		Bentonite
		(ML) SILT and SAND; brown; non-cohesive, moist to wet, dense to very dense	2	4	ss	84			c		
				5	ss	51			c		Sand
	rack Mount Mobile B57	n O.D. Hallow Stem Augers		6	- SS -	32			0	MH 1	May 20, 2021
6	F	(SP) gravelly SAND, trace fines; brown; non-cohesive, wet, very dense	147 215 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	7	ss	84			c		Screen
8				8	SS	71			0		
9		CONTINUED NEXT PAGE		9	SS	50/			o		
				_							
DE	EPTH : 50	ISCALE				C				С	LOGGED: SC :HECKED: YS

PROJECT:	19119989 (2000)
LOCATION:	N 4861620.43; E 633018.12

RECORD OF BOREHOLE: 21-3

BORING DATE: May 4, 2021

SHEET 2 OF 3

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm									HA	MMER T	YPE: AUTOMATIC
ĻĒ				SA	MPL	.ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0,3m	HYDRAULIC CONDUCTIVITY, k, cm/s	0_		
I SCA	METH		LoT		ж.		3m	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	STIN	PIEZOMETER
METH	CN 0	DESCRIPTION	ATA F	DEPTH	MBE	LZPE	NS/0	SHEAR STRENGTH nat V + Q - Cu, kPa rem V, ⊕ U - O	WATER CONTENT PERCENT	L E E	STANDPIPE INSTALLATION
ö			STR/	(m)	z		BLO	20 40 60 80	Wp H WI	₹₹	
- 10		- CONTINUED FROM PREVIOUS PAGE -									
		(CL) sandy SILTY CLAY, some gravel;	and	210,69							
		grey (TILL), contains cobbles and boulders; cohesive, w <pl hard<="" td="" to="" w~pl,=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></pl>									
					10	SS	0.08		0		
- 11											
	5	s a 60									
	bile B	T Easo									
	nt M										
- 12	ck Mo										
	F≞				11	SS	50/ 0.10		0		
- 13											8
	H				12	ss	50/ 0.10		ю – – – – – – – – – – – – – – – – – – –	мн	
- 14											>
										11	
					13	ss	50/		0		
							200				
- 15											2
					14	ss	50/		0		
	~	h					W. C.				
	bile BS										
16	unt Mol				15	ss	50/		0		8
	ck Mot						0.75				
	Tra										
					16		50/				
17							0.15				7
- 18											ŝ
							50/				
	-	END OF BOREHOLE	2020	202.40	17	SS	0.13				
		NOTES									
19		1 NP = Non Plastia									
		2 Water encountered at a death of									
		4.6 m during drilling									
20			-+		_		_	+			
		CONTINUED NEXT PAGE									
DF	РТН	SCALE					2				
1:	50						3	MEMBER OF WEP		CHI	FCKED YS

PROJECT: 19119989 (2000) RECORD OF BOREHOLE: 21-3 SHEET 3 OF												HEET 3 OF 3							
LO	BORING DATE: May 4, 2021 DATUM: Geodetic DATUM: Geodetic DATUM: Geodetic													ATUM: Geodetic					
SP	SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm HAMMER TYPE: AUTOMATIC													YPE: AUTOMATIC					
ALE	SOIL PROFILE SAMPLES DYNAMIC PENETRATION HYDRAULIC CONDUCTIVITY, Kirding PENETRATION KIRDIN KIRding PENETR									., I	ING	PIEZOMETER							
TH SC ETRE	IG ME.	DESCRIPTION	A PLO	Image: Constraint of the second se					ATER CO	ONTENT	PERCE	NT	DITIO TES	STANDPIPE					
ΔEP	BORIN	BEGORI HOW	STRAT	DEPTH (m)	NN	۴	BLOW	Cu, kP	a o 4	.0 6	emiV,⊕ ∩ 8	0-0 0	Wr 1	0 − 2	0 3		WI IO	ΡĞ	
		CONTINUED FROM PREVIOUS PAGE						2											
- 20		 Water level measured in monitoring well as follows: 																	
-		Date Depth (m) Elev. (m) 20-May-21 4.5 216.3																	
-																			
- 21																			3
-																			
-																			
- 22																			
-																			
-																			
-																			
- 23																			3
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219219																			
WIN																			
GAL																			
d9 - 25																			2
RKHA -																			
AM N			5																
19 - 26																			
ERCZ																			
BIN																			
ATANG																			
27																			
KHAM T																			
MAR																			
28 - 28																			3
RCZY																			
IGVBE																			
29																			
SCS																			
ENTS																			
30																			-
S 001			<u> </u>								= -	ļ	1			L	I	·	
击 DE	PTH S	SCALE						6	MEM	SER OF W	E K BP							CH	ECKED: YS

BURNSIDE

R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

<u>AG-MW1</u>

	Page	1	of	1
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LOG OF DRILLING OPERATIONS

Client:	Angus Glen Developments Inc.	Angus	Glen M	ESP	,		Logged by	<i>r</i> : (C. D.	1							
Project N	No.: 300036802	ham, (am, ON Ground (m ar								amsl): 225.80						
Drilling C	Co.: Lantech Drilling Services Inc.	Date Started: 3	8/2/201	/2015 Static Water Le								vel Depth (m):					
Drilling M	Nethod: Hollow Stem Auger	3/2/	2015	Sand Pack	and Pack Depth (m) : 5.48 -												
Donth				Гюл]		7			SAM	1PLE		De	n th			
Scale	Stratigraphic Description	on	Plot	Depth	1		1		Ë	be	i i i	Val.	Sc	pm ale			
(ft) (m)	Surface Elevation (m): 22	5.80	<i>w</i> –	(m)					Ž	Ţ	<u> ۲</u>	ź	(ft)	(m)			
	TOPSOIL	.0.00									17		(11)				
	Dark brown clayey silt, rootlets		-					1	SS	X	8						
-	CLAY Silty	XXX	0.50							/			-				
-	Brown, soft, wet, grey clay mottlin	XXX								7		-					
- 1.0	plasticity, trace fine sand, iron sta	XXX						2	SS	X	18		- 1.0				
	to subrounded, occasional pocket	XXX	224.35							\backslash							
5.0	\medium sand		1.45							/		5.0 —	-				
	Sandy Silt TILL		SI SH						3	ss	X	15					
- 2.0	Brown, stiff, medium plasticity, dry	/, trace to	IN DI								\square			- 2.0			
	subangular to subrounded. iron st	aining,	YKH.						<u> </u>		$\left - \right\rangle$	\square	-				
_	occasional cobble	J,	III)						4	SS	$ \vee $	59		-			
						3			$ / \setminus$								
10.0 - 3.0	sandier and harder with depth		JAJ)										10.0 -	- 3.0			
			SI KI						-	~~~	$ \vee $	01					
-			IN D							33		51		_			
			SI SI SI										_				
- 4.0			JAJA ($\mathbb{N}/$			- 4.0			
			SALL.						6	SS	$ \Lambda $	63					
15.0			HH.										15.0	L			
15.0			SH H								$\mathbb{N}/$		15.0 -				
- 5.0			JAJA I						7	SS	X	>50/3"		- 5.0			
			SIII.														
			JA JA		ſ								_	Ļ			
			SIII.		.		•										
- 6.0			HH.											- 6.0			
20.0-			SALL.								$\mathbb{N}/$		20.0 —				
			HH.			目	·.		8	SS	$ \Lambda $	>50/6"					
			SALL.		-	目	Sandpad	ck			()						
- 70			HH.				Well Scr	een					_	-7.0			
			SHL)		∇		:										
			HH.		<u> </u>									L			
25.0	I		SAL.	g L	[7.62	·		l		\leftarrow		25.0 —	l			
			HH.						9	SS	X	>50/4"					
				0.23													
Prepare	ed By: C. D.	Checked By:	J. S.					Date P	repa	red:	3	3/20	15				
This bor suitable Associat	ehole log was prepared for hydrogeolog for a geotechnical assessment of the su tes Limited personnel before use by othe	ical and/or enviror ubsurface condition ers.	nmenta ns. Boi	l purpos rehole d	ses a lata	and c requ	loes not r ires interp	necessarily pretation by	conta R. J	ain ir . Bur	nform	ation e &		_			
LEGEND	MONITORING W	ELL DATA	SA		ΥPE	AC	A	Iger Cutting	SS		\leq	Split S	Spoo	n			
Vate	r found @ time of drilling Pipe: 51 mm	n dia. PVC				CS		ontinuous	AF	۔ ۲		Air Ro	otarv				
	c Water Level - 6/16/2015 Screen: 51 mm	n dia PVC #10 slot				RC	R	ock Core	W	 ~] ی	<u>_</u>	Wash	Cut	tinas			

LOG OF DRILLING OPERATIONS BG-MW1



R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

Page 1 of 1

							1								
Client:	Berczy Glen Landown	ers Group	Project Name:	Berczy Gle	n Lands		Logged by	r: (C. Diı	nules	scu				
Project	No.: 300033248		kham, ON			Ground (m	n ams	sl):	220.2	2					
Drilling	Co.: Lantech Drilling S	ervices Inc.	Date Started:	9/18/2013			Static Wat	er Le	evel D)epth	n (m):				
Drilling	Method: Hollow Stem	Auger	Date Completed	1: 9/18/201	3		Sand Pack	< Dep	oth (n	ר) : 4	.57 - 6	5.86			
Depth					F	f			SAM	PLE			h		
Scale	Stratig	raphic Desci	ription	Der John Ber	oth			Ξ	e	t.	/al.	Sea	ale		
(ft) (m)	Surface Elevation /m	۰. ۱۰				101400000		Nu	È	Ē	ź	/##\	/m)		
	TOPSOIL - dark b	<u>≁</u> rown loam	220.20	hand "	1) [222222					$\overline{}$			<u>(m)</u>		
	SILTY CLAY - with	sand trace	- fine subrounded		5				SS	Х	24				
	gravel, pockets of f	ine to med	ium grained									_	-		
- 1.0	sand, damp, weakl	y plastic, lu	ight brown, soft,					1	55	\bigvee	21		- 1.0		
	iron staining									$ \land $					
5.0	SANDY SILT trop	o clov, troo	o fino graval light	× ·× 1.5	7					$\overline{7}$		5.0-	-		
	brown, weakly plas	stic. soft. da	imo graver, light imp	× ·× ·)				2	SS	Х	24		- 20		
		<i></i>		<u>× ^ × 1</u> 22	1								-2.0		
-	SAND - very line to	uniform lig	ed , trace slit, ht brown damn			Dentoni	e seal	2		\bigvee	82/10 ⁴		-		
	to wet, loose.	unnonn, ng	ni biown, damp					3	33	\wedge	02/10				
10.03.0						-						10.0 —	- 3.0		
								4	S S	Х	55/6"		_		
													-		
- 4,0					Ŧ								-4.0		
15.0												15.0	-		
4	SANDY GRAVEL -	trace clay	, trace silt, well	0 0 4.7	0		nd pook	5	SS	\mathbf{X}	105		<i>c</i> 0		
1/28/	graded, wet to satu	irated, loos	e, fine to large.	0. a		i siica sa	inu pack						- 5,0		
				0 0								_	-		
	SAND - medium to	very coars	e grained, trace	5,6	4 . E										
20.0 - 6,0	fine gravel, trace si	ilt, uniform	, light brown,					6	SS	\times	77	20.0 -	-6.0		
	Noose, saturated, w	fina ta can	waa awainad	6.2	5			7	58	Х			L		
- GB	subangular to subr	ounded tra	urse grained ace silt_trace clav					8	- 55	\ge					
	cobbles, saturated,	, loose	too ont, trace oray,	6.8	6 6.8	6		I	.						
ZZ	SAND - fine to coa	rse grainec	, trace silt, trace												
	gravel, uniform, lig	ht brown, s	aturated, cobbles												
3328	and boulders														
0000	Stone refusal at 6.8	86 m													
577															
BERO															
248 6															
0033															
S/30															
Ö															
005/300															
Prepa	red By: S. Charity		Checked By	: C. Dinul	escu		Date P	repa	red:	_1	0/7/20	013			
suitable	e for a geotechnical asse ates Limited personnel b	essment of t before use b	eological and/or envi he subsurface condi y others.	tions. Boreh	ole data re	a does no quires inte	r necessaril proretation t	y coi by R.	πain J. B	urnsi	rmatio ide &	n			
	٦			SAMPI			uner Cutting	0		2	Split C	2000			
	≤ ter found @ time of drilling						ontinuoue	10		<u></u>	Air Do	iterii	11		
ĭ ⊥	tic Water Level -	Screen: 5	1 mm dia. PVC #10 elo	e l	BC		ock Core	w	c 🔽		Waeh	Cut	linas		
œ j 🗕 i 🖬	··· · · ·			• 1		اا فقحته		* *	~		1.001	out	yə		
				Lo	g of	F	301	reł	nole	116					
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I	Pro	oject	No.	BRM-00609175-AO								Drawing No.		20	1
I	Pro	oject	:	Geotechnical Investigation	1 - Bercz	zy	Ward	len S	Subdivis	sion		Sheet No.	1	of	1
I	Loc	catio	n:	10206 and 10348 Warden	Avenue	e, I	Markl	ham,	, Ontari	0					
1	Da [:] Dri Da [:]	te Di II Ty _l tum:	rilled: pe:	May 13, 2020 Dietrich 120 Geodetic			Auger S SPT (N) Dynamic Shelby 1 Field Va	ample Value c Cone ⊺ ſube ne Test	Test		Combus Natural N Plastic a Undraine % Strain Penetror	tible Vapour Reading Moisture nd Liquid Limit H ad Triaxial at at Failure neter	€ ⊕	□ < ⊖	
	G W L	SYMBOL		Soil Description	ELEV. m 213.76	DUPTH	Shear	20 Strength	N Value 40 60 0.1	80 MPa 0.2	Combusti 250 Natur Atterber 10	ble Vapour Reading (pp 500 750 al Moisture Content % rg Limits (% Dry Weight) 20 30	n) SAN		atural Unit /eight N/m ³
			TOP:	SOIL - 300mm dark brown sandy	213.5	0	5								
			-SAN	DY SILT - brown, saturated,	/213.1							*			
				Y CLAY - brown, moist, very stiff	/	1			_			- × -			
														2	
			_ - ber	coming grev			0 O					×			
i			bet	conning grey	_	2								4	
			_		_		– 12 Ŏ					- × -			
:			CAN		210.9	2								4	
			and o	cobbles; grey, moist with wet sand		3				81/250mm	×		Į		
		$\langle \rangle \rangle$	_seam	ns, very dense	-									4	
			_		_	4									
[.									60/100	imm	×		Z		
					_	5									
					_										
			_		207.5	6			60/50	mm	×				
			NOT	END OF BOREHOLE ES:											
			1. Gr ins	oundwater monitoring well stalled to 5.84m: sealed with											
			be	ntonite from 0.3 to 2.18m.											
24/20															
DT 6/															
EW.G															
N Ld															
5AO.6															
30917															
3M006															
02 BF															
3WGL															
LAC															



Time	Water Level (m)	Depth to Cave (m)
On completion	Drý	Borehole
After 9 days	0.97	Well
After 14 days	0.99	Well

	Lo	g of	ľ	Bore	h	ole 113				
Project No.	BRM-00609175-AO	•						Drawing No.		16
Project:	Geotechnical Investigation	- Bercz	zy	Warden	S	ubdivision		Sheet No.	1	of _2
Location:	10206 and 10348 Warden	Avenue	e, I	Markhan	ı,	Ontario				
Date Drilled: Drill Type: Datum:	May 19 and 22, 2020 Dietrich 120 Geodetic			Auger Sample SPT (N) Value Dynamic Cone Shelby Tube Field Vane Te	e Te st		Combustib Natural Mo Plastic and Undrained % Strain a Penetrome	ble Vapour Reading bisture d Liquid Limit H Triaxial at t Failure eter	⊂ × ⊕] (Ə
			_			5				
G X W B L O L	Soil Description	ELEV. m	D E P T H	20 Shear Streng	 th	N Value 10 60 80 MPa	Combustible 250 Natural Atterberg	e Vapour Reading (ppr 500 750 Moisture Content % Limits (% Dry Weight) 20 30	n) SAMPLES	Natura Unit Weight kN/m ³
	SOIL - 400mm dark brown silt	214.40	0	8						
SILT grave to ve	Y CLAY - some sand, trace of el; brown, moist to saturated, stiff ry stiff		1	ó				× *		19.70
		212.4		14 Ŏ				×		20.20
SILT	- brown, saturated, compact	212.0	2		22]
SANI scatte satur dens	DY SILT TILL - wet sand seams, ered gravel and cobbles; brown, ated becoming moist at ~3m, e to very dense		3		Ĵ.	60/50mm	×			
- bec	coming grey	-	4			60/Z5mm				
		-	5							
		_	6			60/100mm	×			23.20
			7							
		_	8			60/100mm	×			23.60
			9			60/125mm				
			10			Φ				23.40
		_				60/125mm				23.20

Continued Next Page

[%] exp.

Time	Water Level (m)	Depth to Cave (m)
On completion After 4 hours After 5 days	3.96 0.61 0.58	Borehole Well Well

		Log	g of	ŀ	B	01	re	h	ole	e	1	13						
Pr	oject	No. <u>BRM-00609175-A</u> O												Drav	wing N	lo		16
Pr	oject	Geotechnical Investigation	- Bercz	y	W	arc	len	S	ubdiv	visio	n			S	heet N	lo	2	of <u>2</u>
G W L	SYMBOL	Soil Description	ELEV. m 203.40	DUPTH 1	S	hear	20 Strer	4 igth 0	N Value 0 (9 60	80	MPa 2	Combus 25 Nate Atterb	tible Vapo 50 50 ural Moistu erg Limits 0 2	our Read 00 7 ure Conte (% Dry \ 0	ng (ppm) 750 ent % Veight) 30) SAMPLES	Natural Unit Weight kN/m ³
			-															
			201.9	12	2			5	i0/150mi	m			×					23.30
		END OF BOREHOLE NOTES: 1. Groundwater monitoring well installed to 11.89m; sealed with bentonite from 0.3 to 8.23m.																
1/20																		
JEW.GDT 6/24																		
1175AO.GPJ 1																		
02 BRM00609																		
LAGWGL																		

*exp.

Timo	Water	Depth to
TITLE	(m)	(m)
On completion	3.96	Borehole
After 4 hours	0.61	Well
After 5 days	0.58	Well

		Lo	g of	ŀ	Boreho	ole	113	A							
Proje	ct No.	BRM-00609175-AO	0						Drawing No) .		17			
Proje	ect:	Geotechnical Investigation	- Bercz	zy '	Warden Sul	bdivisio	n		Sheet No	o. 1	(of 1			
Locat	tion:	10206 and 10348 Warden	Avenue	, I	Markham, C	Intario									
Dete				_	Auger Sample	mano		Combus	Combustible Vapour Reading						
Date	Drillea.	Nay 22, 2020		_	SPT (N) Value	0	\square	Plastic a	and Liquid Limit	⊢	$\stackrel{\boldsymbol{}}{\leftarrow}$	\mathbf{D}			
Drill	l ype:			-	Shelby Tube			Undrain % Strair	ed Triaxial at n at Failure	€	€				
Datu	m:	Geodetic		-	Field Vane Test		S	Penetro	meter	4	•				
s	3			П	N	Value		Combust	tible Vapour Readin	g (ppm)	S	Natural			
G Y W B L C L	1 3)	Soil Description	ELEV. m 214.40	DEPTH	20 40 Shear Strength 0.1	60	80 MPa 0.2	25 Natu Atterbe	0 500 75 ral Moisture Conter erg Limits (% Dry W) 20 3	50 ht % eight) 0	- MP-LES	Unit Weight kN/m ³			
		SOIL - 400mm dark brown silt	214.0	ľ											
	- SILT grave to ve SILT SAN scatt dens - be	Y CLAY - some sand, trace of el; brown, moist to saturated, stiff ery stiff - brown, saturated, compact DY SILT TILL - wet sand seams, tered gravel and cobbles; brown, rated becoming moist at ~3m, te to very dense	212.4	1 2 3 4 5 6											
			207.2	7											
AGWGL02 BRM00609175AO.GPJ NEW.GDT 6/24/20	NOT 1. Gr ins be	END OF BOREHOLE ES: roundwater monitoring well stalled to 7.19m; sealed with entonite from 0.3 to 3.53m.													



Time	Water Level (m)	Depth to Cave (m)
On completion After 4 hours After 5 days	Drý 1.14 1.09	Borehole Well Well

BURNSIDE

R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

LOG OF DRILLING OPERATIONS <u>AG-MW12</u>

Page 1 of 1

Client:	Angus Glen Developme	nts Inc.	Project Name:	Angus	Glen M	ESP	,		Logged by	/: (C. D.	<u> </u>				
Project	No.: 300034937		Location: Mark	kham,	ON				Ground (m	(m amsl): 217.20						
Drilling	Co.: Lantech Drilling Sei	vices Inc.	Date Started: 2	2/25/20	15				Static Wat	er Le	evel [Depth	(m):	3.46	;	
Drilling	Method: Hollow Stem Au	uger	Date Completed:	2/2	5/2015				Sand Pac	k Dep	oth (r	n) : 5	.46 - 7	7.62		
Depth Scale	Stratigra	phic Descriptio	n	Strat. Plot	Elev. Depth					m	SAN ed	IPLE ਦ	.Val.	Dep Sca	oth ale	
(ft) (m)) Surface Elevation (m):	21	7.20		(m)					z	Ĥ		z	(ft)	(m)	
	TOPSOIL Dark brown sandy si of rocks, dry	lt, weathered	small pieces							1	SS	X	frozen	-		
- 1.0					215.76					2	SS	A	29	5.0	- 1.0	
- 2.0	FILL Gravel and Sand, fra compact, dry, trace s	igments of roo	cks, loose to							3	SS	X	>100	5.0	- 2.0	
10.0 - 3.0								Holeplu	g	4	ss	X	>50/3"	10.0	- 3.0	
	Condy Cit Till				<u>213.47</u> 3.73	$\underline{\nabla}$				5	ss	X	>50/4"		-	
- 4.0	Grey, stiff, dry, some diameter) subangula	clay, trace g r to subround	ravel (<2 cm ed,							6	ss	X	>50/2"	15.0 -	- 4.0	
- 5.0	becomes harder with	n depth	and							7	ss	Х	>50/4"	_	- 5.0	
- 105 - 20.0 - 6.0														20.0 -	- 6.0	
								Sandpa	ck	8	SS	X	>50/5"	_		
- 7.0					209.58			vveii Sci	reen						- 7.0	
5 25.0 -					7.62		7.62			9	SS	\mathbf{n}	>50/4"	25.0 -		
003493																
EN/300																
sus gr																
DANG																
37.000																
00349(
BS/30																
300 JC																
Prepar	red By: C. D.						Date P	repa	red:	7/	26/2	015				
L I his bo suitable Associa	renole log was prepared f e for a geotechnical asses ates Limited personnel bef	or hydrogeolog sment of the su ore use by othe	ical and/or envirol bsurface conditioners.	nmenta ns. Bo	n purpos rehole c	ses lata	and d requi	oes not i res inter	necessarily pretation by	conta R. J	ain ir . Bur	nside	ation 8 &			
		IONITORING WI	ELL DATA	SA	MPLE T	YPE	AC	A	uger Cutting	SS	s 🖸		Split S	Spoor	า	
ö ▼ Wate	er found @ time of drilling P	ipe: 51 mm	dia. PVC				cs [<u>))</u> C	ontinuous	AF	ע ד	Щ,	Air Ro	otary		
ਜ਼ੋ∣⊥∕ Stat	tic Water Level - 6/16/2015 S	creen: 51 mm	dia. PVC #10 slot				RC	^^^^ R	ock Core	W	cĽ	Ù	Wash	Cutti	ngs	

PROJECT: 14-1186-0012 LOCATION: See Figure 2

DEPTH SCALE METRES

RECORD OF BOREHOLE: 14-16

BORING DATE: May 8, 2014

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP. 760mm

SPT	/DCP	T HAMMER: MASS, 64kg; DROP, 760mm																HAM	MER	₹ TY	PE: AUTOMATIC	;	
	0	SOIL PROFILE			SA	MPL	ES	DYNAMI RESISTA		BLOW	FION S/0.3m	n)	HYDRA	ULIC k. cm	CON	IDUCT	IVITY,	-	т Ц	U		
LCS.	AETH		101		r		3m	20		40	60	8	0	10	-6	10-5	10	J ⁻⁴ 1	0-3		STIN	PIEZOMETH OR	ER
MEIT	NG	DESCRIPTION	TAP	ELEV.	MBE	YPE	VS/0	SHEAR S	STRE	NGTH	nat V	· +	Q- •	WA	ATER	CON	TENT	PERCE	NT	E	B.T	STANDPIP INSTALLAT	'E ION
	BOR		TRA	(m)	N		BLOV	Cu, KFa			iem v	v. ⊕	0-0	Wp	<u>н</u>		-0W		WI	AL	P		
+		GROUND SURFACE	0		\vdash			20		40	60	8	0	10)	20	3	0 2	<u>,0</u>		+		
0		FILL - (ML) CLAYEY SILT, some sand,		214.70		-				+									-	+	+	0	
		organic inclusions; dark brown; cohesive, W <pl firm<="" td="" to="" w~pl,=""><td></td><td></td><td>1</td><td>SS</td><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td><td>ľ</td><td>Concrete</td><td></td></pl>			1	SS	5										0				ľ	Concrete	
		(ML) sandy CLAYEY SILT: pale brown.		214.01		1																	
1		with oxidation staining; cohesive, W <pl,< td=""><td></td><td></td><td>2</td><td>SS</td><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></pl,<>			2	SS	9									0							
1		Sun			Ĺ																		
		(CI) SILTY CLAY, some sand: gray, with		213.33																			
		oxidation staining; cohesive, W>PL, firm				-																	
					3	SS	7									+		-0-	1	PL	2		
2		1																					
		Very thinly bedded with fine sand below			\vdash																		
		existing ground surface			4	SS	12									0							
		1																					
		(ML) sandy SILT some clay to clayey		211.80																			
°		trace gravel, with pockets of medium																					
		very dense	A A		5	SS	83							0								ł	
			A A A	1	-																	l l	
			200	1																		Σ	7
4			AN																				
		1	A A																				
	55	1	0 0																				
	CME	1			6	SS	50/							0									
	n Aug	1	N N A	:																			
5	NOUN v Ster		200	1																		Bentonite Seal	
	ACK N Hollon	1	200	1																			
	TR		4.4.4																			l l	
			Q . 4 . 4																			l l	
6		1	0.0																				
		1	Q 4 2		7	SS	50/							0									
		1	A A		\vdash	-	.13																
		1	A N N																				
7		1	AN																				
		1	44																				
			4 4																				
		1	A A		8	SS	50/							0									
8			A A		<u> </u>		.00																
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		1		1																			
			20.0	1																		1	
9			44.4																				
		1	9 9	4 1	9	SS	50/							0								1	

P

Golder Associates

4 4 4

CONTINUED NEXT PAGE

GTA-BHS 001 S:\CLIENTS\STONYBROOK\BERCZY_CREEK\02_DATA\GINT\1411860012.GPJ_GAL-MIS.GDT_10/6/17

10

1:50

DEPTH SCALE

CHECKED: AM

LOGGED: JG

PROJECT: 14-1186-0012 LOCATION: See Figure 2

RECORD OF BOREHOLE: 14-16

BORING DATE: May 8, 2014

SHEET 2 OF 2 DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

1 I I		SOIL PROFILE			SA	MPL	ES	RESISTANCE, BLO	TION /S/0.3m	2	HYDRAU k	JLIC CON , cm/s	NDUCT	IVITY,	T	10	
METRES		DESCRIPTION	RATA PLOT	ELEV. DEPTH	NUMBER	TYPE	OWS/0.3m	20 40 SHEAR STRENGTH Cu, kPa	60 € nat V. + rem V. ⊕	Q - ● U - ○	10 ⁻⁶ WA ⁻ Wp I	10 ⁻⁵) ⁴ 1(PERCEN)³ ⊥ NT MI	ADDITIONAL LAB. TESTIN	OR STANDPIPE INSTALLATION
10		CONTINUED FROM PREVIOUS PAGE (ML) sandy SILT, some clay to clayey, trace gravel, with pockets of medium sand; grey (TILL); non-cohesive, moist, very dense	ST 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		10	SS	50/ .13	20 40	60 8	30	0	20	3	0 4	0		Bentonite Seal
12 TRACK MOUNTED CME 55 LUARDAN ALLANDAN	HOIIOW STERN AUGERS	Becoming more moist below a depth of approximately 13.1 m below ground surface	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		11	SS	50/ .13				0						
14		Augers grinding below a depth of approximately 14.9 m below ground surface. Inferred cobble/boulder AUGER REFUSAL ON INFERRED COBBLE (POLITINE	A P A P A P A P A P A P A P A P A P A P	199.16 15.54	12	SS	.13 50/ .13				0						Silica Sand Filter
16		END OF BOREHOLE															measured at a depth 3.87 m below ground surface, June 20/14
18																	
19																	

PROJECT:	20146456
LOCATION:	N 4861996.50; E 634983.99

RECORD OF BOREHOLE: KP1 BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HYDRAULIC CONDUCTIVITY, k, cm/s DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -OW WpH - wi (m) 10 40 60 80 20 30 40 20 GROUND SURFACE 204.50 0 ASPHALT (140 mm thick) 0.00 Crushed granular; brown 0.14 1/ 204.05 AS FILL - (SP-SM) SAND, trace gravel, some fines; brown; non-cohesive, moist (CI) SILTY CLAY, some sand; brown, 0.45 1B 203.80 B57 Truck Mount Hollow Sterr 0.70 oxidation staining; cohesive, w<PL, very 2 SS 15 0 MH stiff Ю. Ю. 150 mm SS 15 3 202.52 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole caved to a depth of 1.3 m upon completion of drilling. 2. Borehole was dry upon completion of drilling. 3 S:CLIENTS:REGION_OF_YORK:MAJOR_MACKENZIE_DRIVE:02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD:GPJ_GAL-MIS:GDT_4/5/21 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: JL 1:50 CHECKED: TO

LOCATION: N 4862126.14; E 634957.69

RECORD OF BOREHOLE: KP2 BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HYDRAULIC CONDUCTIVITY, k, cm/s DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m SAMPLES SOIL PROFILE BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10-5 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -OW Wp H - wi (m) 40 60 80 10 20 30 40 20 GROUND SURFACE 207.80 0 ASPHALT (160 mm thick) 0.00 Crushed granular with RAP; brown 0.16 1A 207.37 AS FILL- (SP-SM) SAND, trace gravel, 0.43 1B some fines; brown; non-cohesive, moist B57 Truck Mount 207.04 FILL - (CL-ML) gravelly SILTY CLAY-CLAYEY SILT and SAND, brown; cohesive, w>PL, stiff to very stiff 0.76 Hollow 2 SS 11 ⊢Ө MH d 150 mm SS 3 18 205.82 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole caved to a depth of 1.5 m upon completion of drilling. 2. Borehole was dry upon completion of drilling. 3 S:/CLIENTS/REGION_OF_YORK/MAJOR_MACKENZIE_DRIVE/02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_4/5/21 3. RAP = Recycled asphalt pavement 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: JL 1:50 CHECKED: TO

LOCATION: N 4862283.37; E 634927.65

RECORD OF BOREHOLE: KP3 BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

	щ	G	3	SOIL PROFILE			SAI	MPL	ES	DYNAM RESIST	IIC PEN	ETRATIO	DN /0.3m	ì	HYDRA	ULIC CO	DNDUCT	IVITY,	Т	.0	
	SCAL				OT.		~		ш	20) 4	0 6	60 8	10	10	r ⁶ 10) ⁻⁵ 1(D ⁻⁴ 1	0 ⁻³ L	STIN	PIEZOMETER OR
	TH S ETR		≥ פ	DESCRIPTION	A PL	ELEV.	1BER	Щ	S/0.3	SHEAR	STREN	IGTH r	at V. +	Q - ●	W/	ATER CO	ONTENT	PERCE	NT	E E	STANDPIPE
	Ξ			DESCRIPTION	RAT,	DEPTH	NUN	≿	Ň	Cu, kPa	1	r	em V. 🕀	U-Ō	Wp	H	W		WI	ADC LAB.	INSTALLATION
			ň		STI	(m)	_		В	20) 4	0 6	8 0	0	1() 2	0 3	0 4	0		
		L		GROUND SURFACE		212.00															
Ŀ				Crushed granular; brown		0.00	1.0														-
F	-		Ļ			211.60															-
F	-		Auge	FILL - (SM) SILTY SAND, trace gravel:		0.40	1B	AS	-												-
F		ount	Stem	biown, non-conesive, moist		211.24															-
F		х Х	lov.	FILL - (CL) SILTY CLAY, some sand; dark grev and black, organic inclusions:		0.76		~~~													-
F	- 1	7 Tru	문	cohesive, w~PL, stiff			2	55	''												-
F	-	B5.	0.0			210.63															-
F	-		20 m	(CL) SILTY CLAY and SAND, some		1.37															-
F			₩	gravel, brown, conesive, w <r l,="" sun<="" td="" very=""><td></td><td></td><td>3</td><td>22</td><td>20</td><td></td><td></td><td></td><td></td><td></td><td></td><td>,</td><td></td><td></td><td></td><td></td><td>-</td></r>			3	22	20							,					-
F						210.02	Ŭ	00	20							, 					-
þ	- 2			END OF BOREHOLE		1.98															-
þ				NOTES:																	
þ				1. Borehole caved to a depth of 1.2 m																	-
þ				upon completion of drilling.																	-
þ				2. Borehole was dry upon completion of																	-
_⊧	— 3 -			drilling.																	-
/5/2																					-
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NR/	_																				-
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-BH	DE	PT	ΗS	CALE							GΟ	LC) E F	2						LC	DGGED: JL
GT≠	1:	50												-						СН	ECKED: TO



LOCATION: N 4862501.24; E 634887.30

BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HYDRAULIC CONDUCTIVITY, k, cm/s DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m SAMPLES SOIL PROFILE BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. ТҮРЕ SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -0^W WpH - wi (m) 40 60 80 10 20 30 40 20 GROUND SURFACE 217.50 0 ASPHALT (120 mm thick) 0.00 Crushed granular with RAP; brown 1A 217.15 AS FILL - (SM) SILTY SAND, trace gravel: brown; non-cohesive, moist 0.35 1B B57 Truck Mount 216.75 FILL - (CL-ML) gravelly SILTY CLAY-CLAYEY SILT and SAND, brown; cohesive, w>PL, stiff 0.75 Hollow 2 SS 13 Ο 0 216.13 (SM) SILTY SAND, some gravel; brown; non-cohesive, moist, compact 1 1.37 150 SS 3 16 215.52 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole caved to a depth of 1.5 m upon completion of drilling. 2. Borehole was dry upon completion of drilling. 3 S:/CLIENTS/REGION_OF_YORK/MAJOR_MACKENZIE_DRIVE/02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_4/5/21 3. RAP = Recycled asphalt pavement 4 5 6 7 8 9 10 GTA-BHS 001 DEPTH SCALE GOLDER LOGGED: JL 1:50 CHECKED: TO

LOCATION: N 4862688.03; E 634846.61

RECORD OF BOREHOLE: KP5 BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

s	PT/	DCP	T HAMMER: MASS, 64kg; DROP, 760mm							н	MMER	TYPE: AUTOMATIC
ш		0	SOIL PROFILE			SAI	MPLI	ES		HYDRAULIC CONDUCTIVITY, k. cm/s	T (n	
CALE		ΕIΗ		01				ш	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	TINE	PIEZOMETER
TH S FTR		D M	DESCRIPTION	A PL	ELEV.	BER	Щ	S/0.3	SHEAR STRENGTH nat V. + Q -	WATER CONTENT PERCENT		STANDPIPE
- A B C		ORIN	DESCRIPTION	RAT/	DEPTH	MUN	≿∣	NO.	Cu, kPa rem V. ⊕ Ü - Č		ADC ABB.	INSTALLATION
		BC		ST	(m)			BL	20 40 60 80	10 20 30 40		
_	0	_	GROUND SURFACE		219.80							
E			Crushed granular; brown		0.00							
E		Jer			219.41	1A						
-		n Aug	fines: brown; non-cohesive, moist	₩	0.59	10	AS	-				
-	Moun	v Ster	Recycled asphalt pavement	₩	219.02	ю						
–	1 2	-ollov	dark brown; cohesive, w>PL, stiff			2	ss	9				-
F	357 T	D. P										
-	1	mm	(CL) SILTY CLAY and SAND, some	뙚	218.43 1.37							
F		150	gravel; brown; cohesive, w <pl, stiff<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></pl,>									
F						3	SS	8		ρ		
Ē	2 ├		END OF BOREHOLE	part -	217.82 1.98	\vdash						-
E			NOTES	1								
Ł			1 Pershale equal to - doubt - f 1 0	1								
F			upon completion of drilling.									
E			2. Borehole was dry upon completion of	1								
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BORING METHOD DEPTH SCALE METRES

LOCATION: N 4862905.53; E 634805.64

GROUND SURFACE

RECORD OF BOREHOLE: KP6 BORING DATE: January 21, 2021

SAMPLES

ТҮРЕ

NUMBER ELEV.

DEPTH

(m)

221.80

BLOWS/0.3m

STRATA PLOT

SHEET 1 OF 1

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DESCRIPTION

SOIL PROFILE

HAMMER TYPE: AUTOMATIC DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s ADDITIONAL LAB. TESTING PIEZOMETER ١ Τ OR STANDPIPE INSTALLATION 20 40 60 80 10⁻⁶ 10-5 10-4 10⁻³ SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT -0^W Wp⊢ - WI 40 60 80 10 20 30 40 20

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0			ASPHALT (200 mm thick)		0.00 221.60												
			Crushed granular; brown	***	0.20	1A										м	
		nger	FILL - (SP) SAND, some gravel, trace	×	0.40		AS	-									
	t	۳ ۲	fines; brown; non-cohesive, moist			1B											
	Mou	v Ste		×	220.98	2A											
- 1	ž	ollo	HLL - (CL) SILTY CLAY, some sand; dark brown: cohesive, w>PL, stiff		0.82	2B	22	8						0			-
	7 Tr	L L L				20	55							0			
	B5	0 E		×	220.43												
		l m	(SM) gravelly SILTY SAND; brown		1.37												
		15	(TILL); non-cohesive, moist, compact														
						3	SS	28									
- 2				414	219.82												-
			END OF BOREHOLE		1.90												
			NOTES:														
			1 Borehole caved to a depth of 1.3 m														
			upon completion of drilling.														
			2. Parabala was dry upon completion of														
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LOCATION: N 4863105.31; E 634761.62

BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW WpH - wi (m) 40 60 80 10 20 30 40 20 GROUND SURFACE 222.80 0 Crushed granular; brown 0.00 1A 222.2 AS 0.55 1B FILL - (SP) SAND, some gravel, trace B57 Truck Mount fines: brown; non-cohesive, moist 2A FILL - (SM) SILTY SAND and GRAVEL with RAP; brown; non-cohesive, moist, Hollow 221.83 SS 18 0.97 2B 0 М \compact O.D. FILL - (SM) SILTY SAND and GRAVEL; brown; non-cohesive, moist, compact (CI) SILTY CLAY, trace sand; brown; cohesive, w>PL, very stiff 221.43 1 1.37 150 SS 0 3 15 X 220.82 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole caved to a depth of 1.3 m upon completion of drilling. 2. Borehole was dry upon completion of drilling. 3 S:ICLIENTS\REGION_OF_YORK\MAJOR_MACKENZIE_DRIVE\02_DATA\GI\NT\MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_4/5/21 3. RAP = Recycled asphalt pavement 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: JL 1:50 CHECKED: TO

S:ICLIENTS\REGION_OF_YORK\MAJOR_MACKENZIE_DRIVE\02_DATA\GI\NT\MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_4/5/21

GTA-BHS 001

LOCATION: N 4863330.56; E 634715.76

RECORD OF BOREHOLE: KP8 BORING DATE: January 21, 2021

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m

SAMPLES

SHEET 1 OF 1

DATUM: Geodetic

PIEZOMETER

HAMMER TYPE: AUTOMATIC

HYDRAULIC CONDUCTIVITY, k, cm/s

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

SOIL PROFILE

BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -0^W Wp – - wi (m) 40 60 80 10 20 30 40 20 GROUND SURFACE 223.40 0 ASPHALT (120 mm thick) 0.00 Crushed granular; brown 1A 223.02 0.38 AS FILL - (SP) SAND, some gravel, trace fines: brown; non-cohesive, moist 1B 222.78 0.62 Mount ASPHALT (260 mm) 222.52 2A SS 69/ Hollow B57 Truck N 1 O.D. Hollow FILL - (CL) gravelly SILTY CLAY and SAND, grey; cohesive, w>PL, hard to 0.88 2B Ο stiff 150 1 - Auger grinding at a depth of 1.1 m SS 3 11 221.42 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole caved to a depth of 1.4 m upon completion of drilling. 2. Borehole was dry upon completion of drilling. 3 3. *N value may not be representative of the soil's consistency due to obstructions encountered. 4 5 6 7 8 9 10 DEPTH SCALE GOLDER LOGGED: JL 1:50 CHECKED: TO

PROJECT:	20146456
LOCATION:	N 4863498.29; E 634672.80

RECORD OF BOREHOLE: KP9

BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

	SP	T/DCI	PT HAMMER: MASS, 64kg; DROP, 760mm													IAMN	IER T	YPE: AUTOMATIC
ш	1	DD.	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETR RESISTANCE, BLC	ATION WS/0.3m	ì	HYDRAU	JLIC CC k, cm/s	NDUCTI	IVITY,	Т	. ت	
3CAL	SES	1ETH.		-OT		~		3m	20 40	60 8	0	10-6	° 10	⁵ 10	0 ⁻⁴ 10 ⁻³	\downarrow	STIN	PIEZOMETER OR
5 HLO	AETR	NG N	DESCRIPTION	LA PL	ELEV.	ABEF	ĥ	/S/0.:	SHEAR STRENGT	H nat V. +	Q - ●	WA	TER CO	ONTENT	PERCENT		DITIO	STANDPIPE
1 L	2	BORI		TRA	DEPTH (m)	Ñ	ŕ	BLOW	Си, кРа	rem v. ⊕	0-0	Wp	ŀ	0 ^W -	WI		LAB	
-		ш		ίο Ο				ш	20 40	60 8	0	10	2	0 30	0 40			
-	0		Crushed granular; brown	***	223.20													-
F					222.80	1A												-
F		Auger	FILL - (SP) SAND, some gravel, trace		0.40	18	AS	-										-
E		Stem	Thes. brown, non-conesive, moist															
L	1	uck M ollow	FILL - (CL) gravelly SILTY CLAY and		222.30 0.90	2A	SS	14										-
F		57 Tr D.D. H	SAND, dark brown; cohesive, w <pl, stiff="" stiff<="" td="" to="" very=""><td></td><td></td><td>2B</td><td></td><td></td><td></td><td></td><td></td><td></td><td>)</td><td></td><td></td><td></td><td></td><td>-</td></pl,>			2B)					-
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E		150																-
E					221.22	3	SS	15										-
-	2		END OF BOREHOLE		1.98													
F			NOTES:															-
Ē			1. Borehole caved to a depth of 1.2 m															-
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PROJECT: 20146456 LOCATION: N 4863698.71; E 634626.76

RECORD OF BOREHOLE: KP10 BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10-5 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW - WI Wp (m) 40 60 80 10 20 30 40 20 GROUND SURFACE 223.50 0 ASPHALT (180 mm thick) 223.32 Crushed granular; brown 0.18 223.14 0.36 1A AS FILL - (SP-SM) gravelly SAND, some fines: brown; non-cohesive, moist 1B 0 М 222.75 0.75 B57 Truck Mount FILL - (CL) gravelly SILTY CLAY and SAND, dark brown, organic inclusions; cohesive, w>PL, stiff Hollow 2 SS 12 0 150 mm SS 12 3 0 221.52 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole caved to a depth of 1.3 m upon completion of drilling. 2. Borehole was dry upon completion of drilling. 3 S:CLIENTS:REGION_OF_YORKMAJOR_MACKENZIE_DRIVE/02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_4/5/21 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond DEPTH SCALE GOLDER LOGGED: JL 1:50 CHECKED: TO

PROJECT: 20146456 LOCATION: N 4863918.31; E 634575.98

RECORD OF BOREHOLE: KP11 BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 40 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW WpH - wi (m) 40 60 80 10 20 30 40 GROUND SURFACE 221.20 0 ASPHALT (180 mm thick) 221.02 Crushed granular; brown 0.18 1A AS FILL - (SP-SM) gravelly SAND, some fines: brown; non-cohesive, moist 0.34 1B 220.62 FILL - (CL) gravelly SILTY CLAY and 0.58 B57 Truck Mount Hollow Sterr SAND; dark brown, organic inclusions; cohesive, w<PL, very stiff to hard 2 SS 18 þн MH -1 О. D. 8 150 SS 3 61* - Auger resistance between a depth of 1.8 m and 1.9 m 219.22 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole caved to a depth of 1.2 m upon completion of drilling. 2. Borehole was dry upon completion of 3 drilling. S:/CLIENTS/REGION_OF_YORK/MAJOR_MACKENZIE_DRIVE/02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_4/5/21 3. *N value may not be representative of the soil's consistency due to obstructions encountered 4 5 6 7 8 9 10 GTA-BHS 001 DEPTH SCALE GOLDER LOGGED: JL 1:50 CHECKED: TO

PROJECT: 20146456 LOCATION: N 4864147.22; E 634531.61

RECORD OF BOREHOLE: KP12 BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. TYPE SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH OW - WI WpH (m) 10 40 40 60 80 20 30 GROUND SURFACE 220.10 0 Crushed granular; brown 0.00 1A 219.65 AS Auge FILL - (SP-SM) gravelly SAND, some fines: brown; non-cohesive, moist 1B 0.45 B57 Truck Mount Hollow Stem 219.28 (CI) SILTY CLAY, some sand, some gravel; brown; cohesive, w>PL, stiff 0.82 2 SS 8 0 D 218.73 150 mm (ML) sandy SILT; brown; non-cohesive, wet, compact 1.37 SS 22 0 3 ΜН 218.12 2 END OF BOREHOLE 1.98 NOTES: 1. Borehole caved to a depth of 1.3 m upon completion of drilling. 2. Borehole was dry upon completion of drilling. 3 S:CLIENTS:REGION_OF_YORK:MAJOR_MACKENZIE_DRIVE:02_DATA/GINT/MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_4/5/21 4 5 6 7 8 9 10 GTA-BHS 001 \Diamond GOLDER DEPTH SCALE LOGGED: JL 1:50 CHECKED: TO

PROJECT:	20146456
LOCATION:	N 4864251.68; E 634519.69

RECORD OF BOREHOLE: KP13 BORING DATE: January 21, 2021

SHEET 1 OF 1

DATUM: Geodetic

SI	PT/I	CCP	T HAMMER: MASS, 64kg; DROP, 760mm														HAM	MER T	YPE: AUTOMATIC
ш		8	SOIL PROFILE		SAM	ИРL	ES	DYNAMIC PENETI RESISTANCE BU	RATION	lm L	HY	/DR/	AULIC C	ONDUCT	IVITY,	Т	.0		
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TH S ETR		∑ ປ	DESCRIPTION	A PL	ELEV.	BER	붠	S/0.3	SHEAR STRENGT	"H nat"	V. + Q-		W	ATER C	ONTENT	PERCE	Ĩ NT	DITIC TES	STANDPIPE
DEP			DESCRIPTION	RAT	DEPTH	N∩N	2	NO-	Cu, kPa	rem	V.⊕ U-C		Wp	• 	W		WI	ADI LAB.	INSTALLATION
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— o			GROUND SURFACE		222.80														
Ē			ASPHALT (240 mm thick)		222.56														
F		Jer	Crushed granular; brown	<u> S</u> Š	0.24	1A	AS												
-		n Aug	FILL - (SP-SM) gravelly SAND, some fines; brown; non-cohesive, moist,		0.40	1B													
-	Moun	v Ster	compact																
- 1	Ś	Vellot			221.75	2A	22	15											-
F	357 T	- C	FILL - (SM) SILTY SAND and GRAVEL; brown: non-cohesive, moist, compact		1.05	2B		10				0							
F		E E	(ML) sandy SILT. some gravel, brown:	M	221.43 1.37														
-		150	non-cohesive, moist, compact																
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LOCATION: N 4861907.72; E 635019.68

RECORD OF BOREHOLE: KS1 BORING DATE: January 20, 2021

SHEET 1 OF 2

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SOIL PROFILE SAMPLES BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 40 NUMBER STANDPIPE ELEV. ТҮРЕ SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -0^W WpH - WI (m) 40 60 80 10 20 30 40 GROUND SURFACE 204.00 C ASPHALT (265 mm thick) 0.00 1A 203.74 AS Crushed granular; brown 0.26 1B 203.49 FILL - (SP-SM) gravelly SAND, some 0.51 fines; brown; non-cohesive, moist, compact 2 SS 12 202.63 FILL - (CL-ML) gravelly SILTY CLAY-CLAYEY SILT and SAND; brown, containing asphalt pieces; cohesive, w>PL, stiff SS 0 11 3 2 SS 4 15 201.10 (CL) SILTY CLAY and SAND, some 3 gravel; grey (TILL); cohesive, w~PL to w<PL, very stiff to hard 5 SS 21 мн Bentonite 4 Auger - Auger grinding between depths of 4.3 m and 4.4 m Stem B57 Truck Mount SS 50/ 6 Hollow 5 d o 8 6 SS 0 7 56 7 1.20.00 Sand SS 8 49 8 Screen 9 9 SS 70 0 Sand 194.25 9.75 END OF BOREHOLE 10 CONTINUED NEXT PAGE \Diamond GOLDER LOGGED: YS

GTA-BHS 001 DEPTH SCALE 1:50

S:ICLIENTS\REGION_OF_YORK\MAJOR_MACKENZIE_DRIVE\02_DATA\GI\NT\MARKHAM_WARDEN&KENNEDY_RD.GPJ_GAL-MIS.GDT_4/5/21

CHECKED: TO

PROJECT:	20146456
LOCATION:	N 4861907.72; E 635019.68

RECORD OF BOREHOLE: KS1 BORING DATE: January 20, 2021

SHEET 2 OF 2

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

ſ	щ	ДQ	SOIL PROFILE			SAN	1PLE	s	DYNAM RESIS	MIC PEN TANCE,	ETRATIO BLOWS	DN /0.3m	$\overline{)}$	HYDR	AULIC Co k, cm/s	ONDUCT	TIVITY,	T	٦Ū	
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	EPTH ME1	RING	DESCRIPTION	ATA I	DEPTH	IUMBI	I Z L L)/S/AC	SHEAF Cu, kP	R STREN a	IGTH r	natV. + remV.⊕	Q - ● U - O	W			PERCE	NT	ADDI AB. T	INSTALLATION
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┟	- 10		CONTINUED FROM PREVIOUS PAGE NOTES:			\square	+													
F			1. Water encountered at a depth of																	-
F			9.0 m during drilling.																	-
F			2. Groundwater level was measured in monitoring well at a depth of 2.0 mbgs																	-
E	- 11		(El. 202m) on January 29, 2021.																	-
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LOCATION: N 4862189.80; E 634962.05

RECORD OF BOREHOLE: KS2 BORING DATE: January 4, 2021

SHEET 1 OF 2

DATUM: Geodetic

	0	SOIL PROFILE			SAI	MPLI	ES	RESISTANCE, BLOWS/0.3m	k, cm/s
RES	МЕТЬ		LOT		н.		.3m	20 40 60 80	
MET	ING I	DESCRIPTION	NTA P	ELEV.	JMBE	ЪРЕ	WS/0	SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O	WATER CONTENT PERCENT
	BOR		STRA	(m)	٦٢		BLO	20 40 60 80	$\begin{bmatrix} W_{p} \vdash & \bigcirc^{vv} & \downarrow W_{l} \\ 10 & 20 & 30 & 40 \end{bmatrix} \begin{bmatrix} \overline{4} \\ \underline{4} \\ \underline{4} \end{bmatrix}$
		GROUND SURFACE	1	209.30					
0		Crushed granular; brown		0.00	14				
		FILL - (SM) SILTY SAND, trace gravel: brown; non-cohesive, moist		208.95 0.35 208.54	1B	AS	-		
1		FILL - (CL-ML) gravelly SILTY CLAY-CLAYEY SILT and SAND; brown; cohesive, w <pl, stiff<="" td=""><td></td><td>0.76</td><td>2</td><td>SS</td><td>8</td><td></td><td>0</td></pl,>		0.76	2	SS	8		0
		FILL - (ML) sandy SILT; brown; non-cohesive, wet, compact		1.37	3	SS	14		
2		(ML) SILT and SAND, trace gravel; brown (TILL); non-cohesive, moist, very		207.17 2.13					
		dense	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		4	SS	65		O MH Bentonite
3			A 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		5	SS	85		
4	B57 Truck Mount 200 mm O.D. Hollow Stem Auger	(CL) SILTY CLAY and SAND, some gravel; grey (TILL); cohesive, w <pl, hard</pl, 		205.26 4.04	6	SS	54		
6					7	ss	91		Sand
8					8	SS	92		O
9		END OF BOREHOLE NOTES: 1. Borehole was open and dry upon completion of drilling.		200.03 9.27	9	SS	50/ 0.13		Sand
10		CONTINUED NEXT PAGE	1	t			-	· - + + ·	+

PROJECT:	20146456
LOCATION:	N 4862189.80; E 634962.05

RECORD OF BOREHOLE: KS2 BORING DATE: January 4, 2021

SHEET 2 OF 2

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

ľ	щ	DD	SOIL PROFILE			SAN	1PLE	s	DYNAM RESIS	IC PEN FANCE,	ETRATI BLOWS	DN /0.3m	ì	HYDR	AULIC Co k, cm/s	ONDUCT	TVITY,	Т	10	
	SCAL RES	METH		LOT		R		.3m	2	0 4	06	50 8	0	1	0 ⁻⁶ 1	0 ⁻⁵ 10	0 ⁻⁴ 1	0 ⁻³ ⊥	IONAL	
	MET	RING	DESCRIPTION	ATA F	ELEV. DEPTH	JMBE	TYPE	MS/0	SHEAF Cu, kPa	R STREN	IGTH I	natV. + emV.⊕	Q - ● U - O	W	ATER C	ONTENT	PERCE	NT	AB. TE	INSTALLATION
	B	BOF		STR/	(m)	Ĩ		BLO	2	0 4	0 6	30 8	0		p 2	20 3	i0 4	WI 10		
	- 10		CONTINUED FROM PREVIOUS PAGE																	
ŀ			2. Groundwater level was measured in																	-
Ē	-		monitoring well at a depth of 1.7 mbgs (El. 207.6m) on January 29, 2021.																	-
																				-
	— 11																			-
-																				=
																				-
ŀ																				-
Ē	— 12																			-
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F	- - 13																			-
5/21																				
14 14																				-
IS.GD	-																			-
AL-M	14																			-
Ъ С																				-
SD.G	-																			=
2	-																			-
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N&K																				-
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SKHA	- - 16																			-
LMAF	-																			=
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MAC	— 18 -																			
AJOR																				
K/W																				-
ō	-																			
d Z	- 19 -																			
EGIO																				-
TS/RI	-																			
s:/c	- 20																			-
S 001				II							I	I	I	I		I	I	L		
-A-BH	DE	PTH S	SCALE				ļ	Ĩ	5	GΟ) E F	2						LC	DGGED: YS
U	1:	υc																	CH	EUKED: IU

LOCATION: N 4862378.69; E 634920.57

RECORD OF BOREHOLE: KS3 BORING DATE: January 4, 2021

SHEET 1 OF 1

DATUM: Geodetic

SPT/D	CP	T HAMMER: MASS, 64kg; DROP, 760mm						HAMME	ER TYPE: AUTOMATIC
	2	SOIL PROFILE			SAN	IPLES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	
METRES BORING METH		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE BLOWS/0.3m	20 40 60 80 SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ● U - O 20 40 50 90	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	STANDPIPE INSTALLATION
		GROUND SURFACE	0,	214.70					
1	-	Crushed granular; brown FILL - (SM) SILTY SAND, trace gravel; brown; non-cohesive, moist FILL - (CL) SILTY CLAY and SAND, some gravel; dark brown; cohesive, w>PL, firm		0.00 214.29 0.41 214.00 0.70	1A 1B 2	AS - 3S 7		0	м
2	-	(CL) SILTY CLAY and SAND, some gravel; grey (TILL); cohesive, w <pl, very stiff to hard</pl, 		213.33 1.37	3 5	SS 27		0	
3	jer .	(SM) SILTY SAND, some gravel; brown (TILL); non-cohesive, moist, very dense	A b A b A b A b A b	211.80	4 \$ 5 \$	60 60 60 60 60 60 60 60 60 60 60 60 60 6		0	Bentonite
c b B57 Truck Mount	200 mm O.D. Hollow Stem Au	(CL) SILTY CLAY and SAND, some gravel; grey (TILL); cohesive, w <pl, hard</pl, 		210.66	6	SS 96/ 0.25			
6					7 5	50/ 0.13		0	Sand
8		END OF BOREHOLE NOTES: 1. Borehole was open and dry upon completion of drilling. 2. Groundwater level was measured in monitoring well at a depth of 7.7 mbgs (El. 206.9m) on January 29, 2021.		206.80 7.90	8 5	50/ 0.13			Sanglinuary 29, 2021
10									
DEPTH 1 : 50	НS	CALE					GOLDER		LOGGED: YS CHECKED: TO

CHECKED: TO

LOCATION: N 4862601.12; E 634875.39

RECORD OF BOREHOLE: KS4 BORING DATE: January 18, 2021

SHEET 1 OF 2

DATUM: Geodetic

: L	0	SOIL PROFILE			SA	MPLE	ES	RESISTANCE, BLOWS/0.3m		k, cm/s		_, 0	D-5301
AETRES	NG METH	DESCRIPTION	'A PLOT	ELEV.	ABER	ŕPE	/S/0.3m	20 40 60 80 SHEAR STRENGTH nat V. + Q. •	1 W	0 ⁻⁶ 10 ⁻⁵ 1 ATER CONTENT	0 ⁻⁴ 10 ⁻³	DITIONAL TESTIN	PIEZOMETER OR STANDPIPE
2	BORIN		STRAT	DEPTH (m)	NUN	È	BLOW	Cu, kPa rem V. ⊕ U - O 20 40 60 80	w	p	WI 80 40	ADI	INGTALLATION
0		GROUND SURFACE		218.70									
Ŭ		Crushed granular; brown		0.00	1	AS							
		FILL - (SM) SILTY SAND, trace gravel; brown; non-cohesive, moist, loose		218.28 0.42									
1				217.33	2	SS	6						
		FILL - (CI) SILTY CLAY, some sand; brown; cohesive, w>PL, firm		1.37	3	SS	7				0		
2		FILL - (SM) SILTY SAND, tarce gravel; brown; non-cohesive, moist, loose		216.57 2.13		~~~	e						
3		(SM) SILTY SAND, fine; brown;		215.80 2.90	4	33	0						
		Tion-Contestive, Thoist to wet, very dense			5	SS	61		0			мн	
5	B5/ Iruck Mount mm O.D. Hollow Stem Auger				6	ss	50/ 0.15						Bentonite
6	200 1				7	ss	73			0			 January 29, 2021
8		- 0.3m thick sand blowout was observed at 7.6 m			8	SS	50						
9		- 0.9m thick sand blowout was observed at 9.1 m			9	ss	50/ 0.13			0			
10		CONTINUED NEXT PAGE	- Ciri-	1			-	+	+	· +	+		

PROJECT: 20146456 LOCATION: N 4862601.12; E 634875.39	RECORD OF BOREHOLE: KS4	SHEET 2 OF 2
	BORING DATE: January 18, 2021	
Soil PROFILE	SAMPLES DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s ELEV. H_{u} H_{v} H_{v} DEPTH (m) H_{v} H_{v} H_{v} 20 40 60 80 10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³ SHEAR STRENGTH nat V. + Q rem V. \oplus WATER CONTENT PERCENT Wp $- OW$ WI 10 20 40 60 80 10 10 20 40	T STANDPIPE INSTALLATION
10 CONTINUED FROM PREVIOUS PAGE		
 (SM) SILTY SAND, fine; brown; non-cohesive, moist to wet, very dense - 1.5m thick sand blowout was observed at 10.7 m 13 14 15 16 	10 SS 50 11 SS 65 12 SS 50/13 13 SS 90	Bentonite Sand Screen
 END OF BOREHOLE NOTES: Water was encountered at a depth of 4.6 m during drilling. Sand blowout was cleaned out using water prior to advancing augers. Groundwater level was measured in monitoring well at a depth of 6.6 mbgs (EI. 211.6m) on January 29, 2021. SPT N-value could not be carried out at 16.7mbgs due to a 1.5m sand blowout. The sand could not be completely cleaned out during drilling. 20 		
DEPTH SCALE		LOGGED: YS

Г

PROJECT:	20146456
LOCATION:	N 4862815.63; E 634829.53

RECORD OF BOREHOLE: KS5

BORING DATE: January 15, 2021

SHEET 1 OF 1

HAMMER TYPE: AUTOMATIC

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DATUM: G

	щ			SOIL PROFILE			SA	MPL	.ES	DYNAMIC F	PENETF CE, BLC	RATIC	N).3m)	HYDR.	AULIC C k, cm/s	ONDUCT	IVITY,	Т	<u> </u>	
	SCAL				гот		R		.3m	20	40	6) 80	o `	1	0 ⁻⁶ 1	0 ⁻⁵ 1	0 ⁻⁴ 10	₎₋₃ ⊥	IONA	
	EPTH MET		או	DESCRIPTION	ATA P	ELEV.	JMBE	TYPE	WS/0	SHEAR STI Cu, kPa	RENGT	Ήn re	at V. + m V.⊕	Q - ● U - O	w	ATER C		PERCE	NT	.DDIT NB. TE	INSTALLATION
	DE				STR/	(m)	z		BLO	20	40	6) 8	1	W	p —			NI 0	ΓA	
				GROUND SURFACE		221.30							, <u> </u>	5					0		
Ē	- 0			ASPHALT (280 mm thick)		0.00															
E				Crushed granular; brown	***	221.02 0.28	1A	45													-
F				FILL - (SP) SAND, some gravel, trace fines: brown: non-cohesive, moist		0.41	1B	/.0													-
F				(CI) SILTY CLAY, some sand; brown;	龖	220.54 0.76															
E	- 1			cohesive, w>PL, stiff to very stiff			2	SS	9								0				-
E																					-
F																					
F							3	SS	24												-
E	- 2																				-
F	2			(SP) SAND, trace fines; brown;	par	219.17 2.13															-
ŧ				non-cohesive, moist to wet, very dense																	-
E							4	SS	65						0						-
F						1		1													-
ŀ	- 3						\vdash														-
			ger			Ì	5	SS	56												-
Ę		т	m Au				\vdash														
2		k Moul	ow Ste																		-
	- 4	Truck	. Holle																		-
2 2 2		B57	D.O M																		-
5-			150 m																		-
			Ì				6	ss	83						0						-
	- 5																				-
	0																				-
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																					-
	- 6																				-
E							7	SS	50/ 0.13												-
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E																					-
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ľ						040.40	8	ss	50/							0					-
E	- 8	H	\square	END OF BOREHOLE	N	7.87			0.10												-
ŀ	Ŭ			NOTE:																	-
F				1. Borehole was open and dry upon																	-
E				completion of drilling.																	-
2																					
Ē	- 9																				
Ē																					
ŀ																					
ŧ																					-
F	- 10																				-
2	DF	PT	нs	CALE							<u>~ '</u>			•						LC	DGGED: YS
	1:	50										. U		۲.						СН	ECKED: TO

LOCATION: N 4863022.33; E 634786.84

RECORD OF BOREHOLE: KS6 BORING DATE: January 22, 2021

SHEET 1 OF 1

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HAMMER TYPE: AUTOMATIC

	ОD	SOIL PROFILE			SA	MPLI	ES	DYNAMIC PE RESISTANCE	NETRA	TION /S/0.3m	ì	HYDRA	AULIC C	ONDUCT	IVITY,	Т	.0	
	ETH		oT				Ę	20	40	60 8	_{ان} ک	10	ר ⁶ 1	0 ⁻⁵ 1	0-4 1	0-3 L	INT	PIEZOMETER
	Σ		L L	ELEV.	H H	щ	/0.3					14/					E	STANDPIPE
	NIN	DESCRIPTION	ATA	DEPTH	Ĩ	Ľ٤	SWS	Cu, kPa	NGIII	rem V. \oplus	ũ- Ŏ		ATEN C		FERCE			INSTALLATION
	BOF		STR	(m)	Ī		BLC	20	40	<u> </u>	0	Wp		0		WI 10		
-			0		+		_	20	40	60 8	10	1	0 2	:0 3 	50 4 	40 		
0		GROUND SURFACE		222.30					_									
		ASPHALT (140 mm thick)		0.00	2													
				221.85	1A													
		FILL - (SP) SAND, some gravel, trace		0.42	ź	AS	-											
		fines: brown; non-cohesive, moist		8	1B													
				221.45	5 7A		42											
1		FILL - (CL) SILTY CLAY, some sand;		0.85	5	33	13											
·		brown; conesive, w>PL, stiπ		8	28													
				220.93	3	1												
		(ML) SILT and SAND, some gravel;	j t	1.37	7													
		brown (TILL); non-cohesive, moist,		. .		1												
		compact to dense			3	SS	19						0					
				i														
2				a .														
			4														1	
			[] h	L:													1	
				k.	4	SS	37										1	
					\vdash												1	
				[]													1	
3				i.	-												1	
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	no	St et al																
	≥ ×	<u>s</u>		8- -														
4	리	P		218.26	5													
	B57	o non-cohesive, moist, verv dense	' []-]	. 4.04	1													
		150		:														
					6	88	84											
				j.	Ľ		04											
5				2														
				1														
6																		
						1												
				j.	7	SS	70					0						
				j.														
7				3														
																	1	
				3													1	
																	1	
					\vdash		50/										1	
				214.40	8	SS	0.13										1	
8	- 1	END OF BOREHOLE		7.90)												1	
		NOTE		1														
				1														
		1. Borehole was open and dry upon		1														
		completion to drilling.															1	
		2. RAP = Recycled asphalt pavement															1	
9																	1	
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10				1														
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PROJECT:	20146456	

LOCATION: N 4863216.48; E 634749.77

RECORD OF BOREHOLE: KS7 BORING DATE: January 19, 2021

SHEET 1 OF 1

DATUM: Geodetic

SP	/DC	OCPT HAMMER: MASS, 64kg; DROP, 760mm							HAM	MER T	YPE: AUTOMATIC
,	ДŎ	SOIL PROFILE			SA	MPLE	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ı	DIEZONETED
RES	METH		LOT		H.		J.3m	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	TIONA	OR STANDDIDE
MET	RING	DESCRIPTION	ATA F	DEPTH	UMBE	TYPE)/S/(C	SHEAR STRENGTH Cu, kPanat V. + Q - rem V. ⊕ U - C		AB. TI	INSTALLATION
	BOI		STR	(m)	z		BLC	20 40 60 80	10 20 30 40	Ľ (
0		GROUND SURFACE		223.00							
		Crushed granular; brown		0.00	1	45					
				222 43	'						
		FILL - (SP) SAND, some gravel, trace		0.57							
1					2	SS	32				
							02				
		FILL - (CL) gravelly SILTY CLAY and		221.63 1.37							
		SAND; dark grey and brown, organic inclusions; cohesive, w>PL, stiff									
					3	SS	11				
2		(CL) SILTY CLAY and SAND some		220.87							∇
		gravel; brown; cohesive, w>PL, stiff		2.13							January 29, 2021
					4	SS	10				
											Bentonite
3											
		de d			5	SS	11				
	t l	em Au									
	k Mou										
4	57 Truc	후 		218.96 4.04							
		o non-cohesive, wet, very dense									
	000	2001									
					6	SS	58		0		
5											
6											Sand
					7	SS	89				
											Sorroon 2
7											
				215.10	8	ss	50/ 0.13		0		Sand
8		END OF BOREHOLE		7.90							1.1.1.
		NOTES:									
		1. Water was encountered at a depth of 4.6 m during drilling.									
		2. Groundwater level was measured in									
9		monitoring well at a depth of 2.2 mbgs (El. 220.8m) on January 29, 2021.									
		, , , , , , , , , , , , , , , , , , , ,									
10											
DEF	ΡТΗ	H SCALE								LC)GGED: JL
1:5	50							GOLDER		CH	ECKED: TO

LOCATION: N 4863405.94; E 634706.26

RECORD OF BOREHOLE: KS8 BORING DATE: January 22, 2021

SHEET 1 OF 2

DATUM: Geodetic

		-	The winder of the too, of the proof , roomin									
	ДŎ		SOIL PROFILE			SA	MPLE	s	YNAMIC PENETRATION	HYDRAULIC CONDUCTIVITY, k, cm/s	TLo	DIEZOMETER
	DRING METH		DESCRIPTION	RATA PLOT	ELEV.	NUMBER	TYPE	.OWS/0.3m	20 40 60 80 HEAR STRENGTH nat V. + Q - ● u, kPa rem V. ⊕ U - C	10 ⁶ 10 ⁵ 10 ⁴ 10 ³ WATER CONTENT PERCENT Wp - 0 ^W WI	ADDITIONAL -AB. TESTIN	PIEZOME I EI OR STANDPIPE INSTALLATIC
	B	\downarrow		STF	(m)	-		В	20 40 60 80	10 20 30 40		
0		+	GROUND SURFACE		223.50		_	_			_	[[.
			FILL - (SP) SAND, some gravel, trace		223.02 0.48	1A 1B	AS	-				Sand
1			fines; brown; non-cohesive, moist FILL - (CI) SILTY CLAY, some sand, trace gravel; dark grey and brown, organic inclusions; cohesive, w>PL, stiff to firm		222.65 0.85	2A 2B	ss	13				
2						3	ss	9		φ		
					220.60	4	ss	7				Bentonite
3			(CL) SILTY CLAY and SAND, trace gravel; brown; cohesive, w>PL, firm		2.90	5	SS	7		ющ	мн	
4		Auger	(CL) SILTY CLAY and SAND, some gravel; brown to grey (TILL); cohesive, w <pl, hard<="" td=""><td></td><td>219.46 4.04</td><td></td><td></td><td></td><td></td><td></td><td></td><td> January 29, 2021</td></pl,>		219.46 4.04							 January 29, 2021
5	B57 Truck Mount	200 mm O.D. Hollow Stem	- Becoming grey at a depth of 5.6 m			6	SS	40				
6						7	SS	80		0		
8						8	SS	48				Grout
9						9	SS	31		0		
10		_	CONTINUED NEXT PAGE					_	-+	+		

	PROJECT: 20146456 RECORD OF BOREHOLE: KS8 SHEET 2 LOCATION: N 4863405.94; E 634706.26 BORING DATE: January 22, 2021 DATUM:														HEET 2 OF 2				
	LU	JATIC	JN: N 4863405.94; E 634700.20				F	30RI	NG DATE: J	anuary 22	2, 2021						DA	ATUM: Geodetic	
	SP	T/DCF	² T HAMMER: MASS, 64kg; DROP, 760mm T													HAMM		YPE: AUTOMATIC	;
CALE	Ś	THOD	SOIL PROFILE	ΤĿ	 	SA	.MPL	ES c	RESISTANCE	BLOWS	/0.3m	<u> </u>		cm/s	;11V111,		TING	PIEZOMETE	R
PTH SC	AETRE	NG ME	DESCRIPTION	LA PLO	ELEV.	ABER	ΥΡΕ	/S/0.3r	SHEAR STRE	AU C	1at V. +	Q- •	WATE	ER CONTEN	IT PERCEI	NT	DITIO	STANDPIPE	E ON
DEF	~	BORII		STRAI	DEPTH (m)	NN	Ĥ	BLOW	Cu, kPa	r 40 f	em V.⊕	U - O	Wp H	O ^V	<u>ل</u>	wi	AD		
	10		CONTINUED FROM PREVIOUS PAGE			Þ	Ľ	\square				Ľ							
	10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 -	B57 Truck Mount B57 Truck Mount B57 Truck Mount B67 200 mm 0.D. Hollow Stem Auger 200 mm 0.D. Hollow Stem Auger 80	 CONTINUED FROM PREVIOUS PAGE (CL) SILTY CLAY and SAND, some gravel; brown to grey (TILL); cohesive, w<pl, hard<="" li=""> END OF BOREHOLE NOTES: 1. Water was encountered at a depth of 7.0 m during drilling. 2. Groundwater level was measured in monitoring well at a depth of 4.1 mbgs (EI. 219.4m) on January 29, 2021. </pl,>		(m) 206.41 17.00		ss ss ss ss	80/ 0.28 50/ 0.07 50/ 0.07 75 130/ 0.18										Grout Bentonite Sand Screen Sand	
	19 20																		-
	DEI	PTH ٤ 50	SCALE		<u>.</u>	1			GC) E F	2	I				LC CH)gged: JL Ecked: To	

LOCATION: N 4863597.66; E 634660.05

RECORD OF BOREHOLE: KS9 BORING DATE: January 28, 2021

SHEET 1 OF 2

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HAMMER TYPE: AUTOMATIC DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR BLOWS/0.3m 20 NUMBER STANDPIPE ELEV. ТҮРЕ SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT DESCRIPTION INSTALLATION DEPTH -0^W WpH - wi (m) 40 60 80 10 20 30 40 GROUND SURFACE 222.90 C Crushed granular; brown 0.00 1A 222.48 AS FILL - (SP) SAND, some gravel, trace 0.42 1B fines; brown; non-cohesive, moist 222.17 0.73 FILL - (CL) gravelly SILTY CLAY and SAND; brown and black, organic inclusions; cohesive, w<PL, stiff to very 2 SS 28 0 stiff SS 3 10 2 220.77 (SM) SILTY SAND; brown; 2 13 non-cohesive, moist to wet, compact to dense SS 4 19 3 S:/CLIENTS/REGION OF YORKIMAJOR MACKENZIE DRIVE/02 DATA/GINTIMARKHAM WARDEN&KENNEDY RD.GPJ GAL-MIS.GDT 4/5/21 5 SS 29 4 B57 Truck Mount 6 SS 42 0 Hollow 5 Bentonite 200 mm 6 SS 7 35 _____ January 29, 2021 7 SS 31 0 8 8 214.29 8.61 (CL) SILTY CLAY and SAND, some gravel; grey (TILL); cohesive, w>PL, very stiff 9 9 SS 19 10 CONTINUED NEXT PAGE GTA-BHS 001 \diamond GOLDER DEPTH SCALE LOGGED: YS 1:50 CHECKED: TO

LO	0.0	TIO	N N 4000507.00 E 004000.05									
	CA	TIO	N: N 4863597.66; E 634660.05				В	ORI	G DATE: January 28, 2021		D	ATUM: Geodetic
SP	РТ/С	CP	T HAMMER: MASS, 64kg; DROP, 760mm							HA	MMER T	YPE: AUTOMATIC
ш Л	9		SOIL PROFILE			SAI		S	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	T J Z	PIEZOMETER
DEPTH SC/ METRES		BORING MEI	DESCRIPTION	STRATA PLO1	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	20 40 60 80 SHEAR STRENGTH nat V. + Q (20, kPa rem V. ⊕ U (20 40 60 80	10 ⁶ 10 ⁵ 10 ⁴ 10 ³ WATER CONTENT PERCENT Wp WW WW	ADDITION LAB. TESTI	OR STANDPIPE INSTALLATION
- 10 - 11 - 12 - 13 - 14 - 15 - 16	B57 Truck Mount B57 Truck Mount	200 mm O.D. Hollow Stem Auger	CONTINUED FROM PREVIOUS PAGE (CL) SILTY CLAY and SAND, some gravel; grey (TILL); cohesive, w>PL, very stiff (ML) SILT and SAND, some gravel; grey (TILL); non-cohesive, moist, compact (ML) SILT and SAND, some gravel; grey (TILL); non-cohesive, moist, compact (SM) SILTY SAND and GRAVEL; grey; non-cohesive, wet, very dense (CL) SILTY CLAY and SAND, some gravel; grey (TILL); cohesive, w <pl, hard<="" td=""> END OF BOREHOLE NOTES: 1. Water was encountered at a depth of 6.1 m during drilling 2. Groundwater level was measured in monitoring well at a depth of 7.0 mbgs (EL 215.9m) on January 29, 2021</pl,>	ANA ANANANANA ANA ANA ANA ANA ANA ANA A	DEPTH (m) 211.24 11.66 209.72 13.18 208.19 14.71 207.38 15.52	100 10 11 12 13	F- SS SS SS	NOTB 18 25 52 52	20 40 60 80		AD	Bentonite Sand Screen
- 17 - 18												
· 19 · 20												

1 : 50

PROJECT: 20146456 LOCATION: N 4863803.25; E 634615.91

RECORD OF BOREHOLE: KS10 BORING DATE: January 20, 2021

SHEET 1 OF 2

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

	DO	SOIL PROFILE			SA	AMPL	ES	RESISTAN	PENE NCE, B	TRATIONS	DN /0.3m	2	HYDR/	AULIC C k, cm/s		IVITY,	Т	0,		
ŝ	ШH		OT				Ę	20	40) F	SO 8	_{ان} ک	1	0 ⁻⁶ 1	0 ⁻⁵ 10)-4 1(∩ ^{.₃} ⊥	INAL	PIEZOMETE	R
L R	∑ ()		PL,	ELEV.	SER	щ	\$/0.3			274 7	i atV ⊥	<u> </u>				PERCE	ĭ	E	STANDPIPI	E
Ξ	SINC	DESCRIPTION	ATA	DEPTH	Ĩ	۱Ĕ	NS No	Cu, kPa	INENC	r	em V. 🕀	ũ- Ŏ		ATER C	ow	FERGE			INSTALLATIO	NC
	BOF		TR/	(m)	Z		BLO						W	p			WI			
_			0				-	20	40) 6	50 8 	0	1		20 3	0 4	.0 			
0		ASPHALT (265 mm thick)		223.20		-	-													
		ASI HALI (203 min thick)		222.94																
		Crushed granular; brown		0.26	1	AS	-													
		FILL - (SP) SAND, some gravel, trace		0.45	5															
		fines; brown; non-cohesive, moist,		×.																
		compact		Š.																
1				×.	2	SS	11							0						
				221.94	_	-														
		FILL - (CL) gravely SILTY CLAY and		1.26	5															
		SAND, DIOWII, CONESIVE, W-FL, IIIII		×																
				×.	3	SS	5													
				3	L															
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				8																
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				3	4	SS	7							0						
				200.00	\vdash	1														
		(SM) SILTY SAND. fine: brown:	- XXX	220.30	ť –															
		non-cohesive, moist to wet, compact to		·	\vdash	1														
		dense		1	5	SS	25													
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GTA-BHS 001 S:\CLIENTS\REGI

DEPTH SCALE 1 : 50

10

END OF BOREHOLE

- - - - - -CONTINUED NEXT PAGE

NOTES:



213.60 9.60

LOGGED: YS

CHECKED: TO

PROJECT:	20146456
LOCATION:	N 4863803.25; E 634615.91

RECORD OF BOREHOLE: KS10 BORING DATE: January 20, 2021

SHEET 2 OF 2

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

	щ	ОD	SOIL PROFILE			SAMF	PLES	DYNAMIC PENETRATION HYD RESISTANCE, BLOWS/0.3m					HYDRAULIC CONDUCTIVITY, k, cm/s				PIEZOMETER
	SCAL	METH	DESCRIPTION	гот		ж.	.3m	20 40 60 80				10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³				IONAL	
	METH	RING		ATA F	EV. PTH	UMBE	0/S/Q	SHEAR S Cu, kPa	TRENGTH	nat V. + Q- rem V.⊕ U-0		WATER			NT	AB. TE	INSTALLATION
	ā	BOI		STR (m)	z	BLG	20	40	60 80		10	20 3	30 4	0	L A	
	- 10		CONTINUED FROM PREVIOUS PAGE 1. Water was encountered at a depth of 7.6 m during drilling.														
			2. Groundwater level was measured in monitoring well at a depth of 7.8 mbgs (El. 215.4m) on January 29, 2021														-
	- 11																
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	- 12																
	•																-
4/5/21	- 13																
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Y RD.GP																	-
KENNED	- 15																-
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KHAM W	- 16																-
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DATA/GI																	-
RIVE/02	- 17																
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GTA-BH	DE 1 :	PTH S 50	SCALE					G	OLC	DER						L(CH	DGGED: YS ECKED: TO
PROJECT: 20146456 LOCATION: N 4864045.36; E 634563.11

RECORD OF BOREHOLE:

BORING DATE: January 20, 2021

KS11

SHEET 1 OF 1

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

t		ç	ξ.	SOIL PROFILE			SA	MPL	ES	DYNA		ETRATI	ON)	HYDR	AULIC Ç	ONDUCT	FIVITY,	т							
	CALE ≣S	H	ŧ ŀ		тс				ε	RESIS	n ANCE,	BLOWS	/u.3m	»°,	1	к, cm/s) ⁻⁶ 1	0-5 1	0-4 1	₀-₃ ⊥	TING	PIEZOMETER					
	ETRE	۲ M		DECODIDION	A PLO	ELEV.	BER	Ж	\$/0.3	SHEAL			natV +	0 - •	w	ATER C		PERCE	NT	TES	STANDPIPE					
	ME	NIN		DESCRIPTION	RAT/	DEPTH	NUM	Σ	ŇO	Cu, kP	a	1	rem V. ⊕	ũ - Õ	W	→ ⊢	W		wi	ADC ABC	INSTALLATION					
		a C	3		STF	(m)	2		В	2	20 4	0 0	50 E	30	1	0 2	20 3	30 4	0							
	- 0			GROUND SURFACE		218.70																				
E	0			Crushed granular; brown		0.00	1A								0											
Ŀ				FILL - (SP) SAND, some gravel, trace	諁	218.40	1B	AS	-											м						
Ŀ				fines; brown; non-cohesive, moist	×>>>	218.19 0.51																				
Ē				FILL - (CL) gravely SILTY CLAY and	XX	217.95 0.75																				
Þ	- 1			SAND, black and brown, containing			2	SS	12												-					
F				cohesive, w~PL to w>PL, stiff to soft																						
F																										
-																										
F							3	SS	13						0						-					
E	- 2																									
E																					-					
E							4	22	3												$\overline{\Delta}$					
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F																					Bentonite -					
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S.G		k Mot	ow St																		-					
W-	- 4	Truc	린			214.66															-					
6A	-	B57	D.O.n	(CL) SILTY CLAY and SAND, some		4.04																				
GPJ			00 m	hard																						
8			0																		-					
Ľ.							6	SS	39																	
N	- 5																				-					
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ΥΥ Έ	- 6																									
AM/							7	SS	50/						0											
INIC									0.07												[XEX] -					
NTA/																					BH3 -					
	- 7																				Screen					
10 10	'																									
JRI-																										
									50/																	
N H			+	END OF BOREHOLE	riat	7.72	8	SS	0.10												sand <u>(*),514</u> -					
MACI	- 8			NOTES:																						
A R				1. Water was encountered at a depth of																	-					
MAJ				2.3 m during drilling.																	-					
NK/				2. Groundwater level was measured in																	-					
옷				(El. 216.2m) on January 29, 2021																	-					
j.	- 9																				-					
05																					-					
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GTA	1:	50										_		-						СН	CHECKED: TO					



R.J. Bernside & Associates Limited 15 Townine, Drangeville, Ontario L9W 3R4 telephone (519) 941-5331 fax (519) 941-8120

LOG OF DRILLING OPERATIONS

<u>RJB9</u>

Page_1_ of _1_

	Clie	ent:	North Markham Lando	Project Name:	Project Name: North Markham					Logged by: D. Weir							
	Pro	ject	No.: PTN14385.0		Location: Mark	ham				Ground (m	Ground (m amsl): 220.00						
	Dril	ling	Co.: Lantech Drilling S	ervices Inc.	Date Started: 6	6/5/200	8			Static Wat	ter Le	evel (I	m am	nsl): 2	213.8	2	
	Dril	ling l	Method: Hollow Stem	Auger	Date Completed:	6/5/	2008			Sand Pack	k (m :	amsl)): 2	14.21	- 21	2.38	
	De Sc	pth ale	Stratig	raphic Descripti	on	Strat. Plot	Elev. Depth	$\left[\right]$			lum.	SAN	IPLE	l.Val.	Dep Sca	oth ale	
	(ft)	(m)) Surface Elevation (m): 2	20.00		(m)				2			2	(ft)	(m)	
	_	-	brown, moist, com	a, trace clay, tr			<u>219.39</u> 0.61				1	SS	\bowtie	11	-	-	
	50-	- 1.0	rootlets, brown, mo	e gravel, trace bist, compact	ciay, trace	677777	2 <u>18.63</u> 1.37				2	SS	X	18	50-	- 1.0	
	0.0	- 2.0	SILTY SAND TILL, brown, moist, com	some clay, tra pact	ice gravel,		217.87				3	SS	\boxtimes	17	0.0	- 2.0	
5/25/09	-	-	SILTY SAND, trace moist, very dense	e gravel, brown	, oxidized,		-		h antan'i		4	SS	\boxtimes	98/20cm	-	-	
E.GDT (10.0-	- 3.0					 		Dentoni	te seal	5	SS	\mathbf{X}	50/3cm	10.0 -	- 3.0 -	
EMPLAT	-	- 4.0									6	SS		50/10cm	-	- 4.0	
S.GPJ T	15.0-	- 5.0									7	SS	\square	50/5cm	15.0 —	- 5.0	
DLE LOG	-	-									8	SS	$\overline{\mathbf{X}}$	50/3cm	-	-	
BOREH	20.0-	- 6.0	- wet at 6.10 m					⊻ ∏			9	SS		50/5cm	20.0 -	- 6.0	
RKHAM	-	- 7.0	SAND, trace silt, br	own, oxidized,	wet, very		6.71 6.71		silica sa	and pack	10	SS		50/8cm	_	- 7.0	
ORTH MA	25.0-	- 8.0						7.62			11	SS		50/5cm	25.0 -	- 8.0	
LE F:\STAFF\JACKIE\PROJECTS\PTN14385 NORTH MARKHAM LANDS\BOREHOLE LOG	Pre		red By: J.Shaw prehole log was prepared bnical assessment of the	for hydrogeologic	Checked By: cal and/or environme	J. T	hompsc irposes a	Dn nd does	s not nece	Date Pressarily conta	repa in inf	red:	1 tion s	1/5/20	008 Die foi	r a	
ANGEVILL	bef		use by others.	MONITORING		SA								Split S			
G OR	<u> </u>	Wat	<u></u> ter found @ time of drillina	Pipe: 51 m	m dia. PVC			CS		Continuous	AF			Air Ro	tarv	ſ	
BHLO	$\overline{\nabla}$	Stat	tic Water Level - 7/7/2008	Screen: 51 m	m dia. PVC #10 slot			RC	<u>^</u> F	Rock Core	W	'c 🗠		Wash	, Cutti	ngs	



Soil Engineers Ltd.



LOG OF BOREHOLE NO: 220 FIGURE NO: 20A JOB NO: 1308-S161 JOB DESCRIPTION: Proposed Residential Development JOB LOCATION: Area Bounded by Major Mackenzie Drive East, Kennedy Road, METHOD OF BORING: Hollow-Stem/Wash-Bore Elgin Mills Road East and McCowan Road DATE: October 23 & 24, 2013 City of Markham SAMPLES Dynamic Cone (blows/30cm) Atterberg Limits 30 60 90 120 Depth Scale (m) WATER LEVEL Depth SOIL × Shear Strength (kN/m2) LL 50 100 150 200 DESCRIPTION N-Value Elev. Number Penetration Resistance Moisture Content (%) Type (m) Ο (blows/30cm) 10 30 50 70 10 90 20 30 40 0.0 Ground Surface 0 208.9 41 cm TOPSOIL DO 8 1 (6 Brown, firm to stiff, weathered SILTY CLAY, TIII 23 1 DO 2 9 some sand to sandy a trace of gravel occ. wet sand and silt seams and layers, cobbles and boulders 3 DO 8 1.9 207.0 2 Brown, compact to very dense weathered 4 DO 15 0 SANDY SILT, TIII Not applicable due to wash-boring 3 a trace to some clay 5 DO 64 a trace of gravel \cap . occ. wet sand and silt seams and layers, cobbles and boulders 4.0 4 204.9 Brown, very dense 7 DÒ 6 83 5 SILTY SAND, TIII 6 50 15dm10 traces of clay and gravel DO 7 50/ occ. wet sand and silt seams and 15 layers, cobbles and boulders 7.0 7 201.9 Brown, very dense SILTY FINE SAND 15dm DO 50/ 8 15 8 a trace of clay occ. silt seams and layers 8.6 Grey, very dense SANDY SILT, Till 200.3 (Continued on Fig. 20B) 9.0 9





Soil Engineers Ltd.





BURNSIDE

R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

LOG OF DRILLING OPERATIONS AG-MW6D

Page 1 of 2

	Client: Angus Glen Developments Inc.			Project Name:	Logged by: I. Murphy									
	Proj	ect N	No.: 300034937	Location: Mark	ham,	ON		Ground (m amsl): 223.80						
	Drill	ing C	Co.: Lantech Drilling Services Inc.	Date Started: 3	8/18/20	15		Static Wa	ter Le	evel D	Depth	ı (m):	6.7	B
	Drill	ing N	Method: PQ Coring	Date Completed:	3/18	8/2015		Sand Pac	k De	pth (n	n) : 1	4.32	- 17.	98
	_									SAM	PLE		_	
	De	pth alo	Stratigraphic Descriptio	n	lot	Elev.			-i	e			De	pth alo
	(E)		Curface Flowation (m):	2 00	ώщ				N	Т _У	μ		30 (#)	
H	(11)	(m)	See MW6s-AG for stratigraphy	3.80		(m)							(11)	<u>(m)</u>
		_				-	benton	ite seal						L
	_					L							_	
		- 1.0												- 1.0
	5.0-	_				-							5.0-	L
	0.0					L							0.0	
		- 2.0												- 2.0
	_	_				-	steel ca	asing					-	F
						-								
•	10.0 -	- 3.0											10.0 -	- 3.0
		_				-								F
	_					F							_	
		- 4.0												- 4.0
	15.0-	_				F							15.0 -	F
						-								
21/16		- 5.0												- 5.0
JT 1/	_	_				–							_	F
E.GD						-								
2LAT	20.0 —	- 6.0											20.0 —	- 6.0
TEM		_				Γ	grout							⊢ I
GPJ	_					-	I¥8 8						_	
ILEN.		- 7.0												- 7.0
US G	25.0	_				216.18							25.0	F
ANG	20.0 -		SAND (SP)			7.62							25.0 -	
1937		- 8.0	With silt, fine to medium grained, p	boorly graded,										- 8.0
0034	_	_	brown, wet, unatant			[CORE			_	F
EN/30						-								
S GLI	30.0 —	- 9.0											30.0 -	- 9.0
NGU		-	trace gravel saturated dilatant at	9.8 m										F
00_A	_	10.0		0.0 111						CORE			_	10.0
37.00		- 10.0	SILT (ML)	vity brown										- 10.0
0349(25.0	-	moist, some oxidation, tarce clav a	at 10.4 m		213.13							25.0	Γ
\$\300	55.0-	_ 11 0	(grey, dry)			10.67							35.0 -	- 11 0
JOB		11.0	SILT (TILL)		ST SH									11.0
\300	_	_	I race clay, trace fine sand, trace p	bebbles,						CORE			_	_
ECTS				ey, ury	SI SH	-								
ROJ	Pre	pare	ed By: C. D.	Checked By:	J. S.			Date P	repa	red:	7/	26/2	015	
INT/	This suit	s bor ahle	ehole log was prepared for hydrogeolog	ical and/or enviror	nmenta	l purpo	ses and does not	necessarily	cont	ain in	form	ation		_
P:\G	Ass	ocia	tes Limited personnel before use by othe	ers.	.5. 00			Pictation Dy	, i t . J	. Dun	13100			
H	FG				54	мрі т		uger Cutting		<u>s</u> [5	ব	Solit	Snoo	n
Gu	V	Wate	er found @ time of drilling Piper					Continuous	۵C ۵L				oterv	
HLOC	$\overline{\nabla}$	Statio	c Water Level - 6/16/2015 Screen 51 mm	dia PVC #10 elot				Rock Core	W	л С		Wash		linas



R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

Page_2_ of _2_

AG-MW6D

	Client: Angus Glen Developments Inc.	Project Name: An	Logged by: I. Murphy							
	Project No.: 300034937	Location: Markha	am, ON		Ground (m amsl): 223.80					
	Drilling Co.: Lantech Drilling Services Inc.	Date Started: 3/1	8/2015		Static Wat	(m): 6	.78			
	Drilling Method: PQ Coring	Date Completed:	3/18/2015		Sand Pack Depth (m) : 14.32					7.98
	Depth Scale Stratigraphic Description	Strat	to Elev. Depth			m	AMI Abe	PLE E		Depth Scale
	(ft) (m) Surface Elevation (m): 223.	80	(m)			z	Ĥ	_	(f	t) (m)
JJECTS1300 JOBS1300034937.0000_ANGUS GLEN1300034937_ANGUS GLEN.GPJ TEMPLATE.GDT 1/21/16	40.0 40.0	ned, poorly		grout bentonite silica sar well scre	e seal					
PRO.	Prepared By: C. D.	Checked By:	J. S. Jental nurnoses and	I does not n	Date P	repar	ed:	7/2	26/201	5
PH P:\GINT	suitable for a geotechnical assessment of the sub Associates Limited personnel before use by other	surface conditions.	Borehole data rec	uires interp	retation by	R. J.	Burr	side	e &	
IUELP	LEGEND MONITORING WEI	L DATA	SAMPLE TYPE AC	Au	ger Cutting	SS	\geq		Split Sp	oon
00 0	Water found @ time of drilling Pipe: 51 mm c	lia. PVC	CS	s 💟 Co	ontinuous	AR		<u>ן</u>	Air Rota	ry
BHL	⊻ Static Water Level - 6/16/2015 Screen: 51 mm c	lia. PVC #10 slot	RC	R	ck Core	WC	~ 1	<u>۱</u>	Wash C	uttings



R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

Page_1_ of _1_

AG-MW6S

ſ	Clie	ent:	Angus Glen Developments Inc.	Project Name: Angus Glen MESP						Logged by: C.D.						
	Pro	ject	No.: 300034937	Location: Markham, ON						Ground (m amsl): 223.80						
	Dril	ling	Co.: Lantech Drilling Services Inc.	Date Started:	8/17/2	015				Static Wat	er Le	evel [Depth	ı (m):	dry	
	Dril	ling	Method: Hollow Stem Auger	Date Completed	3/1	7/2015				Sand Pack	k Dep	oth (r	n) : 5	.5 - 7	.62	
	De Sc	epth ale	Stratigraphic Description	ı	Strat. Plot	Elev. Depth	$\left[\right]$				um.	SAM	IPLE	.Val.	De Sca	oth ale
	(ft)	(m)	Surface Elevation (m): 223	3.80		(m)					z			z	(ft)	(m)
		_	TOPSOIL Dark brown, clayey, fine rootlets								1	SS	X	46		-
	- 5.0	- 1.0	CLAY Silty Brown, firm, moist, trace to some f	ine sand,		- 222.95 0.85					2	SS	\square	38	5.0 -	- 1.0
	_	- 2.0	SAND Silty Fill like, brown, fine to medium, co	mpact, moist,		1.64					3	ss	\square	51	_	- 2.0
	10.0-	- 3.0	subangular to subrounded)	nameter,				be	ntonite	e seal	4	SS	\square	>50/4"	10.0 -	- 3.0
	_	-	OAND			220.07 - 3.73					5	SS	igwedge	>50/5"	_	-
	15.0	- 4.0	Brown, fine to medium, compact to moist, uniform, trace silt, occasion	o dense, al gravel	· · · ·						6	SS	X	>50/5"	15.0	- 4.0
/21/16	15.0-	- 5.0	from 6.6 m - fine to coarse, dense,	saturated	· · · · · · · · · · · · · · · · · · ·										15.0 -	- 5.0
TE.GDT 1/	-	- 6.0			· · · · ·	·					7	SS	X	>50/3"	_	-
U TEMPLA	20.0-	-			· · · · · · · · · · · · · · · · · · ·			sili	ca sar	nd pack	8	SS	X	>50/3"	20.0 -	-
S GLEN.GP	-	- 7.0				 		we	ell scre	en					_	- 7.0
ANGU	25.0-	5				216.18 7.62	7.6	2			9	55	\bigtriangledown	>50/4"	25.0	-
4937													\bigtriangleup			
30003																
GLEN																
IGUS (
00_AN																
937.00																
00034																
DBS/3																
)f 00E/																
IECTS.																
I'PRO.	Pre Thi	epar	red By: C. D.	Checked By: cal and/or environ	J. S	al purpos	ses and	Idoes	not n	Date Processarily	repa	red: ain ir	7/	26/2	015	
H P:\GIN1	suit Ass	able	e for a geotechnical assessment of the sul ates Limited personnel before use by othe	bsurface conditio	ns. Bo	prehole d	lata rec	uires	interp	pretation by	R. J	. Bur	nside	e &		
UELPI	LEG	END	MONITORING WE	ELL DATA	SA	MPLE T	YPE AC		Au	iger Cutting	SS	\triangleright	\leq	Split S	Spoo	n
000	Ţ	Wate	er found @ time of drilling Pipe: 51 mm	dia. PVC			CS] Co	ontinuous	AF	۰ 🗉		Air Ro	otary	
BHL	$\overline{\Delta}$	Stat	ic Water Level - 6/16/2015 Screen: 51 mm	dia. PVC #10 slot			R		Ro	ock Core	W	с⊡		Wash	Cutt	ings



R.J. Burnside & Associates Limited 292 Speedvale Avenue West, Guelph, Ontario N1H 1C4 telephone (519) 823-4995 fax (519) 836-5477

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<u>AG-MW7</u>

Client:	Angus Glen Developments In	c. Project Name:	Angus	Glen M	ESP			Logged by	y: (C. D.				
	NU 300034937		2/24/20	UN 15				Ground (n	tor Lo	51): NOLE	212.(0.2	7
Drilling N	Actorial Hollow Stom Auger	Date Starteu.	<u>2/24/20</u>	10				Static Wa		th (r	$\frac{1}{2}$	43 - '	0.3	<u>/</u>
	nethou. Honow Stern Auger		J. <u>ZIZ4</u>	12015				Sanu Pac						
Depth	Chrotiananhia I	Description	at.	Elev.					-	υ		.	De	ptl
Scale	Straugraphic	Jeschption	물로	Depth		٦			Zun	Typ	l_t	2	Sc	ale
<u>ft) (m)</u>	Surface Elevation (m):	212.00	h	(m)					<u> </u>			_	(ft)	<u>(n</u>
_	Darl brown loam, rootlets	/	/	211.66 0.34	$\overline{\nabla}$				1	SS	Х	13		L
- 1.0	SAND Brown, fine to coarse, loo trace small gravel	se, dry, well graded,							2	SS	X	62	_	- 1
5.0 2.0	Becomes wet at 0.7 m an gravel (<2 cm diameter) s	d very coarse, some subrounded to		<u>210.52</u> 1.48					3	SS	X	31	5.0 —	- 2.
	SAND Silty Brown, fine to medium, co	oles ompact, friable, moist					Holeplug		4	SS	X	53	-	-
	to wet, well graded, trace cm diameter) subrounded occasional iron staining	clay, trace gravel (<2 I to rounded,		3.00					5	SS	\square	54	10.0 -	
- 4.0	Becomes dense with dep	th		1 6 9					6	SS	X	>50/5"	15.0	- 4.0
- 5.0	Till like, brown, fine to me well graded, some clay, tr diameter) subangular to r	dium, dense, moist, race gravel (<2 cm ounded							7	SS	X	>100	- 15.0	- 5.
0.0 6.0	from 3.8 m - inferred sear with coarse sand, wet	ns of silt and pockets		• • • •					8	ss	\searrow	>50/4"	20.0 —	- 6.
	OAND						Sandpac Nell Scre	k een			\bigtriangleup		_	
25.0	Brown, fine to coarse, loo graded, trace silt	se, saturated, well							9	SS	X	>50/4"	25.0 —	
25.0	graded, trace silt			204.38 7.62		7.62							25.0 —	
Prepare This bor	ed By: C. D. ehole log was prepared for hyd for a geotechnical assessment	Checked By drogeological and/or envird t of the subsurface conditi	: J. S. onmenta ons. Boi	l purpos	ses ar	nd doe	es not n	Date P ecessarily retation by	repa conta	red: ain ir . Bur	7/ nform	26/2 ation	015	
Prepare his bor uitable Associat	ed By: C. D. ehole log was prepared for hyc for a geotechnical assessment tes Limited personnel before us	Checked By drogeological and/or envir t of the subsurface conditions se by others.	: J. S. onmenta ons. Boi	l purpos rehole c	ses ar data re	nd doe equire	es not n s interp	Date P ecessarily retation by	repa conta / R. J	red: ain ir . Bur	7/ nform nside	26/2 ation e &	015	
Prepare This bor suitable Associat	ed By: C. D. ehole log was prepared for hyd for a geotechnical assessment tes Limited personnel before us MONIT	Checked By drogeological and/or enviro t of the subsurface conditions se by others. ORING WELL DATA	: J. S. onmenta ons. Bol	l purpos rehole c MPLE T	ses ar data re YPE A	nd doe equire	es not n s interp	Date P ecessarily retation by ger Cutting	repa conta / R. J	red: ain ir . Bur	7/ nform nside	2 6/2 ation & Split \$	015	on
Prepare his bor uitable Associat EGEND <u>V</u> Wate	ed By: C. D. ehole log was prepared for hyc for a geotechnical assessment tes Limited personnel before us r found @ time of drilling <u>MONIT</u> Pipe:	Checked By drogeological and/or enviro t of the subsurface conditions se by others. ORING WELL DATA 51 mm dia. PVC	: J. S. onmenta ons. Boi <u>SAI</u>	l purpos rehole c MPLE T	ses ar data re YPE A	nd doe equire	es not n s interp Au	Date P ecessarily retation by ger Cutting ntinuous	repa conta / R. J SS AF	red: ain ir . Bur	7/ nform nside	26/2 ation & Split S Air Ro	015 Spoo	



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AG-MW4

	Clie	nt:	Angus Glen Developments Inc.	Project Name:	Logged by	gged by: I. Murphy									
	Pro	ject N	lo.: 300034937	Location: Ma	rkham, (ON			Ground (m amsl): 223.00						
	Dril	ing C	O.: Lantech Drilling Services Inc.	Date Started:	3/2/201	5			Static Wat	ter Le	evel [Depth	(m):	0.1	1
	Dril	ing N	lethod: Hollow Stem Auger	Date Complete	ed: 3/2/2	2015			Sand Pac	k Dep	oth (r	n) : 2	.14 -	4.57	
	De Sc	pth ale	Stratigraphic Descriptio	n	Strat. Plot	Elev. Depth				.mu	SAN ed	IPLE ti	.Val.	De Sc	pth ale
	(ft)	(m)	Surface Elevation (m): 22	3.00		(m)	$\overline{\nabla}$			z	μ́-	-	z	(ft)	(m)
		-	SANDY SILT (TOPSOIL) Fine grained, poorly graded, low p brown, frozen	lastic fines,		222.70 0.30	<u>×</u>			1	SS	X	56		-
	5.0-	- 1.0	SILT (ML) Trace fine sand, non-plastic, hard dry, trace clay at 0.9 m	, dark brown,		<u>- 221.93</u> 1.07		bentonit	e seal	2	SS		5	5.0 —	- 1.0
	_	- 2.0	Trace fine sand, medium plasticity	v, firm, light about 1.7 m,		<u>220.87</u> 2.13				3	SS	\square	20	_	- 2.0
			brown, moist]					4	SS	\land	102		
	10.0 -	— 3.0 —	Trace clay, very fine grained sand plasticity, hard, moist, light brown,	, low trace gravel		<u>219.65</u> 3.35		silica sa	nd pack	5	SS	\square	50+	10.0 —	- 3.0
	-	- 4.0	SILT (TILL) Trace clay, trace fine sand, trace	oebbles,		_		well scre	en	6	SS	X	50+	_	- 4.0
1/21/16	15.0-	- 5.0	stone at 4.1 m grey, moist, hard at 4.4 m				4.57			7	SS	\mathbf{X}	50+	15.0 -	- 5.0
2TS\300 JOBS\300034937.0000_ANGUS GLEN\300034937_ANGUS GLEN.GPJ TEMPLATE.GDT 1			yrey, ury at 4.0 m		J										

ŭ					
ROJE	Prepared By: C. D.	Checked By:	. S.	Date Prepared:	7/26/2015
INT/P	This borehole log was prepared	I for hydrogeological and/or environm	ental purposes and does n Borebole data requires in	ot necessarily contain info	rmation ide &
H P:\G	Associates Limited personnel b	efore use by others.		terpretation by R. J. Dunis	
UELPI	LEGEND	MONITORING WELL DATA	SAMPLE TYPE AC	Auger Cutting SS 🖂	Split Spoon
DG G	Water found @ time of drilling	Pipe: 51 mm dia. PVC	cs 💭	Continuous AR	Air Rotary
BHLO	∑ Static Water Level - 6/16/2015	Screen: 51 mm dia. PVC #10 slot	RC	Rock Core WC	Wash Cuttings

JOB NO: 1402-S061

LOG OF BOREHOLE NO: 1

FIGURE NO: 1

JOB DESCRIPTION: Proposed Residential Development

JOB LOCATION: 10565 Warden Avenue, City of Markham



JOB NO: 1408-S150

LOG OF BOREHOLE NO: 1

FIGURE NO: 1

METHOD OF BORING: Flight-Auger

JOB DESCRIPTION: Proposed Residential Development

JOB LOCATION: 10231 Warden Avenue, City of Markham (Part 11 of Lot 22)

