

Terraprobe

*Consulting Geotechnical & Environmental Engineering
Construction Materials Inspection & Testing*

**HYDROGEOLOGICAL REPORT
AIRPORT ROAD IMPROVEMENTS
FROM KING STREET TO HUNTSMILL DRIVE
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL, ONTARIO**

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EXECUTIVE SUMMARY

Terraprobe Inc. (Terraprobe) has been retained by IBI Group (IBI) on behalf of the Regional Municipality of Peel to provide hydrogeological engineering services in support of the Schedule C Class Environmental Assessment for Airport Road between King Street and Huntsmill Drive, and also transportation improvements on Old Church Road between Airport Road and Marilyn Street, in the Town of Caledon, Regional Municipality of Peel, Ontario.

Within the project limits there are three major water course crossings and four culvert crossings that were studied. The culvert numbers and their approximate locations can be summarized as follows:

- **Culvert No. 1: Station 17+145:** Tributary of Centreville Creek, crossing Airport Road approximately 80 m north of Huntsmill Drive;
- **Culvert No. 3: Station 15+750:** Centreville Creek, crossing Airport Road approximately 25 m north of Mountcrest Road;
- **Culvert No. 7: Station 12+360:** Tributary of the West Humber River approximately 500 m south of Castlederg Sideroad; and
- **Culvert No. 9: Station 9+960:** Tributary of Salt Creek, crossing at approximately 95 m north of King Street.

The following dewatering requirements are expected given the current requirements for culvert replacement and improvements at the Site:

- Dewatering is anticipated to be required for Culverts 1, 3, 7 and 9 where it is envisaged that open cut excavations will be required to install the new culverts.
- For preliminary design purposes the estimated water taking volume from excavations required to install Culverts 1 and 3 simultaneously is approximately 156,500 L/day. The dewatering system should also be designed to accommodate a typical 2-year design storm event (32 mm rainfall event) which will generate approximately 11,500 L/day, hence resulting in a total anticipated dewatering volume of approximately 168,000 L/day.
- Negligible seepage into excavations is anticipated at Culverts 7 and 9 since the groundwater level is estimated to be below the base of excavation.
- Construction dewatering activities will require a posting to the Ontario Ministry of the Environment Conservation and Parks (MECP) Environmental Activity and Sector Registry (EASR). Posting to the EASR is required for construction dewatering activities where the dewatering volume is more than 50,000 L/day and less than 400,000 L/day.
- It is expected that construction dewatering activities will not require an application to the Ontario Ministry of the Environment Conservation and Parks (MECP) for a Permit to Take Water (PTTW). A PTTW is only required for dewatering volumes that exceed 400,000 L/day.
- The dewatering zone of influence is expected to range from about 5 to 10 m around open excavations. Potential sources of contamination are not expected within zones of influence of dewatering activities.



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1.0 INTRODUCTION

Terraprobe Inc. (Terraprobe) has been retained by IBI Group (IBI) on behalf of the Regional Municipality of Peel to provide hydrogeological engineering services in support of the Schedule C Class Environmental Assessment for Airport Road between King Street and Huntsmill Drive, and also transportation improvements on Old Church Road between Airport Road and Marilyn Street, in the Town of Caledon, Regional Municipality of Peel, Ontario. A site location plan is provided as Figure 1.

The scope of work for the hydrogeological engineering services is outlined in Terraprobe's proposal titled "*Consulting Engineering Services for Airport Road, Schedule C Class Environmental Assessment, From King Street to Huntsmill Drive. Proposal Number: 2017-246P, The Regional Municipality of Peel, Ontario*" dated September 27, 2017.

The purpose of this study was to assess the groundwater conditions and preliminary dewatering requirements for potential construction activities at the Site, where relatively deep open cut excavations are required to install new culverts.

The culvert numbers and their approximate locations are summarized below.

- **Culvert No. 1: Station 17+145:** Tributary of Centreville Creek, crossing Airport Road approximately 80 m north of Huntsmill Drive;
- **Culvert No. 3: Station 15+750:** Centreville Creek, crossing Airport Road approximately 25 m north of Mountcrest Road;
- **Culvert No. 7: Station 12+360:** Tributary of the West Humber River approximately 500 m south of Castlederg Sideroad; and
- **Culvert No. 9: Station 9+960:** Tributary of Salt Creek, crossing at approximately 95 m north of King Street.

It is understood that Culverts 1, 3 and 7 will be replaced with open footing or concrete box culverts. Culvert 5 is an 825 mm concrete pipe (CP) replacement.

The following third-party reports, provided by Peel Region, were reviewed for background information relevant to the geologic and hydrogeologic conditions of the Site and study area:

- Bryck, L.G. (1982). "Preliminary Soil Investigation, Proposed Residential Subdivision, Lot 2, Concession 6, Township of Caledon". File No. T 3193-HY. Issued February 4, 1982.
- Domison Soil Investigation Inc (1983). "*Geotechnical Investigation, Water Storage Reservoir, Caledon East, Ontario*". Reference No. 83-5-8. Issued June 1983.
- Geo-Environ Limited (1977). "*Groundwater Development Program, Caledon East Area, Regional Municipality of Peel, Test Drilling*". Report issued in November 1977.
- Geo Kamp Limited (2010). "*Hydrogeological Report – Existing Conditions Caledon East Additional Water Supply and Storage, Municipal Class Environmental Assessment, Regional Municipality of Peel, Ontario*". Geo Kamp Limited Reference #258. Issued as draft on June 22, 2010.
- Geo Kamp Limited (2010). "*Groundwater Development Program - Draft, Village of Caledon East*". Geo Kamp Limited Reference #258. Issued as draft on January 22, 2010.
- Terraprobe (1992). "*Subsurface Investigation, Proposed Local Sanitary Sewers, Caledon East, Ontario*". File No, 92180B. Issued on October 13, 1992.
- R.J. Burnside & Associates Limited (2010). "*Issues Evaluation and Threats Assessment, Region of Peel*" File No. MTB132950.0000. Issued in July 2010.

- KMK Consultants Limited (2000). *“First Engineer’s Report, Region of Peel, Town of Caledon, Caledon East System”*. Issued in November 2000.
- Geo-Environ Limited (1986). *“Caledon East Settlement Area Servicing Study, Town of Caledon, Region of Peel”* File No. 86-436. Interim report issued in November 1986.
- SPL Beatty (2010). *“2009 Water Quality Monitoring Report for Caledon East”*. File No. 418-091. Issued in June 2010.
- SPL Beatty (2011). *“2010 Water Level Monitoring Report for Caledon East”*. File No. 410-1001. Issued in February 2011.
- SPL Beatty (2011). *“2010 Water Quality Monitoring Report for Caledon East”*. File No. 410-1001. Issued in April 2011.
- GENIVAR Inc. (2012). *“2011 Caledon East Water Level Monitoring Program”*. Project No. 111-15207-00. Issued in April 2012.
- GENIVAR Inc. (2012). *“2011 Caledon East Water Quality Monitoring Program”*. Project No. 111-15207-00. Issued in April 2012.
- Beatty & Associates Limited (2008). *“2007 Water Quality Monitoring Report for Caledon East”* File No. 418-091. Report Issued in July 2008.
- GENIVAR Inc. (2013). *“2012 Water Level Monitoring Report for Caledon East”* Project No. 111-15207-00-0414012. Report Issued in March 2013.
- Region of Peel (2014). *“Caledon East Water Level & Water Quality Monitoring, Annual Report: 2014”*.
- Lotowater Ltd. (1996). *“Performance Testing – Caledon East Well #2”*. Project No. 097-005. Draft Report issued on January 23, 1996.
- Rural Development Consultants Limited (1991). *“Well Construction Program, Caledon East Well #4, Town of Caledon”*. Project No. 90-1002. Draft Report issued in April 1991.
- Stantec Consulting Ltd. (2002). *“Ground Water Under the Direct Influence of Surface Water Assessment - - Caledon East Wells No, 2, 3 and 4”*. File No. 609-00113. Issued in October 2002.
- Geo Kamp Limited (2020). *“Well Construction Program, Village of Caledon East, Caledon East Well No. 6”*. Geo Kamp Limited Reference #258. Issued on October 21, 2020.
- SPL Consultants Limited (2011). *“Geotechnical Investigation – Revised Report, Water Main Replacement – Old Church Road, Region of Peel Project 11-1190, Caledon, Ontario”*. Project No. 592-1063R1. Issued on October 24, 2011.
- Unknown (n.d.). *“Operating Manual for Caledon East Well Pumping Station No. 3”*
- Ontario Ministry of the Environment and Climate Change (2016). *“Permit to Take Water Amendment – Water Supply, 20 Robert Carson Dr Lt 20 Concession 1 EMR, Caledon Region of Peel”*. Reference No. 5777-A34RSA. PTTW No. 1335-A3GFJ8. Issued on January 7, 2016.
- SPL Consultants Limited (2012). *“Hydrogeological Investigation, Watermain Replacement, Walker Road East, Between Airport Rd and Marilyn Way, Caledon, Ontario”*. Project No. 592-1059. Issued on March 22, 2012.

2.0 SCOPE OF WORK

The scope of work for the hydrogeological investigation consisted of the following:

- *Review of background information and completion of site inspection.* Documents available for the study area were reviewed to determine the status of existing wells, local and regional stratigraphy,

groundwater flow direction, and any areas of concern identified by source water protection jurisdictions. A site inspection was also completed to confirm existing site conditions including adjacent site use, topography, drainage, and vegetation.

- *Completion of single-well response tests.* Groundwater measurements were obtained from the installed monitoring wells and single well response tests were carried out in these monitoring wells. The results of these tests were used to obtain the hydraulic conductivities of the subsurface soils.
- *Dewatering Assessment.* An assessment of the groundwater inflow rates and volumes into open excavations was carried out for the four culvert sites. The information obtained from the single well response tests and soil grain size information was utilized to estimate dewatering volumes for preliminary designs.
- *Hydrogeological Report.* A hydrogeological report has been prepared as part of the deliverable requirements. Provided within the report are recommendations on the estimated dewatering volumes and rates as well as mitigation measures that are likely required.

3.0 DESCRIPTION OF SITE CONDITIONS

3.1 Site Location and Description

The south limit of the project is approximately 100 m north of King Street, i.e. Sta. 9+965, and the north limit is approximately 300 m north of Huntsmill Drive, i.e. Sta. 17+370, with chainage increasing from south to north. The project also includes Old Church Road from Airport Road to Marilyn Street (eastern entry).

Within the project limits Airport Road is a paved two-lane arterial road that passes through the village of Caledon East. The road conforms to an urban section through Caledon east and is a rural section with partially paved shoulders outside of the village of Caledon East as further identified below:

- Rural cross section: between south project limit (Sta. 9+965) and approximately 200 m south of Hilltop Drive (Sta. 15+210);
- Urban cross section: approximately 200 m south of Hilltop Drive (Sta. 15+210) to Walker Road West (Sta. 16+300); and
- Rural cross section: between Walker Road West (Sta. 16+300) and north project limit (Sta. 17+370).

There are multiple culvert crossings that convey watercourse flows below Airport Road. Centreville Creek is a major watercourse that flows below Airport Road via a concrete structure built in 1960.

The Site is bounded by a mixture of commercial and residential properties to the north, commercial properties to the south and a mixture of residential and agricultural property use to the east and west around the centre and southern portions of the Site.

3.2 Site Topography and Drainage

The Site has an approximate ground surface elevation varying between Elev. 300 masl and Elev. 280 masl and generally slopes from north to south. Drainage of this transportation corridor is via roadside drainage swales and ditches that direct flow to the various tributary crossings including Centreville Creek and a tributary of Centreville Creek. Centreville Creek crosses the Site at approximately Mountcrest Road and its tributary crosses the north portion of the Site north of Huntsmill Drive.

Innis Lake is located approximately 560 m east of the Site, and several tributaries that drain into the lake traverse the study area. Additionally, the Humber River is located approximately 435 m east of the Site and several wetlands and ponds are located to the east and west of the Site.

3.3 Regional Physiography and Geology

Based on published geological information for the area, the Site (from north to south) traverses the Oak Ridges Moraine, the Niagara Escarpment, and the South Slope physiographic regions. The overburden at the north portion of the Site is composed of ice-contact stratified deposits (6) consisting of sand and gravel, minor silt, clay and till; glaciofluvial deposits (7) consisting of river deposits and delta topset facies; and modern alluvial deposits (19) containing clay, silt, sand, gravel, and maybe organic remains. The overburden at the central and south portions, between south of Larry Street and Airport Road, is primarily till (5d) composed of clay to silt-textured till derived from glaciolacustrine deposits.

The bedrock at the Site is of the Queenston Formation (55a), which is comprised of shale, limestone, dolostone, and siltstone. Based upon historic borehole information from the MNRF and Water Well Records in the vicinity of the Site from the MECP, the depth to bedrock at the north portion of the Site is approximately 24.7 m and is approximately 6.1 m at the south portion. The depth to bedrock at the central portion of the Site is greater than 50 m.

The geological and hydrogeological conditions in the vicinity of the Site were also assessed based on the Ontario Ministry of the Environment Conservation and Parks (MECP) well records, attached in Appendix B. The MECP well locations are presented in Figure 9. Geological cross sections of the Site were prepared from information obtained from the MECP water well records and are presented in Figure 10.

A variety of soil stratigraphy conditions were encountered in previous subsurface investigations noted in Section 1.0 above, conducted within Caledon East and its immediate surroundings, ranging from layered sands and silts in the vicinity of Centreville Creek, graduating to sand or silty sand soils away from the creek and glacial till soils to the south of the village.

The northern portion of the site, in the vicinity of Caledon east, is located within the Caledon East Meltwater Channel. The meltwater channel follows the valley occupied by the East Credit River and Centreville Creek. A shallow unconfined aquifer, recharged by Centreville Creek is located within the meltwater channel. A second deep, hydraulically separate, aquifer known as the Granite Stones Aquifer is present in the study area. The aquifer is confined by a deposit of Newmarket Till. The Granite Stones Aquifer Complex is expected to be encountered approximately 55 m below ground surface at Caledon East. The Granite Stones Aquifer Complex is artesian, with ground water levels measured above ground surface. An artesian pond is located at 13699 Airport Road which evidently indicates the presence of excess hydrostatic pressure in water bearing deposits. Ground water leakage from the artesian pond into Boyce Creek has also been noted. A third aquifer is anticipated in the buried bedrock valley aquifer complex, possible 150 m below ground surface at Caledon East.

Currently the proposed depths of excavation do not extend to the expected depths of the Granite Stones Aquifer. It is not expected that artesian conditions at depth, would pose a concern for the culvert installations examined herein in this report. Due to the presence of the noted artesian pond at 13699 Airport Road, Terraprobe recommends further investigation and instrumentation for shallow groundwater between the Walker Road and the northern extents of the study area. It is recommended that further investigation be completed as part of the detailed design process for the proposed culvert replacements.

3.4 Regulatory Mapping

The northernmost portion of the Site i.e. the area between the Site's north boundary to approximately 500 m south of Old Church Road, is located within municipal well head protection zones. Portions of the Site and the study area are also regulated by the Toronto and Region Conservation Authority (TRCA) as illustrated on the mapping presented in Appendix A.

Based on the mapping within the Peel Region database, the Site is fully located within the Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Protection Region. It is noted that the area adjacent and west and north of the Site is an Environmentally Sensitive Area. The Ministry of Natural Resources (MNR) shall be consulted and any approvals shall be obtained prior to completing any work within that area. In addition, a Highly Vulnerable Aquifer (HVA) is present across the majority of the Site. Significant Groundwater Recharge Areas (SGRAs) are present adjacent to most of the Site.

A portion of the Site is located within an area defined as the Oak Ridges Moraine (ORM), and is generally within the Settlement and Rural Settlement Areas within the ORM Plan, with a portion of the site falling within the Natural Linkage Area. The Natural Heritage System in the MNR mapping matches the Natural Core Area within the ORM Plan. The ORM extends from the north boundary of the Site to just north of Boston Mill Road. The Site is also located within the Greenbelt area, which extends from just north of Boston Mill Road to beyond the south boundary of the Site and is regulated by the Greenbelt Plan. A portion of the Site, between Mono Road and Caledon East is considered Protected Countryside by the Greenbelt Plan.

According to regulatory mapping, the northern portion of the Site, between the north boundary and Hilltop Drive, is located within the Wellhead Protection Area Zones A, B and C (WHPA-A, WHPA-B and WHPA-C) and is a recharge management area. As per the TRCA documents, it is noted that this area is affected by groundwater use and is affected by recharge reduction. Communication with Peel Region's Source Water Protection department indicates that the Region's Caledon East Well 2 was decommissioned in November 2017, but wellhead protection mapping has not yet been updated to reflect this change. As a result, the proposed project does not pose a significant risk to the drinking water supply in the area. Since a reduction of groundwater recharge is not anticipated based on the nature of the proposed works (i.e. reducing groundwater recharge area coverage post construction) a water balance study is not required. However, as requested by Peel Region's Water Resources Management Department; we recommend carrying out a water balance study.

Under the Clean Water Act, the presence of HVAs and SGRA's within the study area constitutes dewatering operations on the Site as moderate or low drinking water threats. As a result, policies relevant to the Site relate to the storage and handling of road salt and dense non-aqueous phase liquids, which are not proposed under the scope of the project.

3.5 Groundwater Resources

The MECP records (Appendix B) of wells located within approximately 500 m of the Site were reviewed to assess the general nature and use of the groundwater resource in the area. An attempt to obtain private well records for properties within the vicinity of the Site was carried out as part of a private well survey completed on November 20, 2017. Private wells were either capped, decommissioned, or access was not provided by the owners. Based on the site observations, it is anticipated that the majority of the properties within the vicinity of the Site are serviced with a combination of municipal water and private wells. Due to the age of the previous survey and the lack of response noted in the well survey, it is recommended that

an updated well survey be conducted to assess baseline water levels and ground water quality for private water supply wells situated within a 500 m radius of the site as part of investigations for detailed design.

A summary of the data obtained from this review is presented below. It should be noted that enforcement of the “*Ontario Water Resources Act, R.R.O. 1990, Regulation 903*” increased the number of wells that were tagged and recorded within the last 10 years creating a bias in the number of wells recorded by the MECP during this period.

Well Construction

Wells finished in bedrock	7
Wells finished in overburden	263
Total	270

Well Uses

Monitoring/Test Hole	88
Domestic	84
Unknown/Not Used	71
Livestock	9
Municipal	7
Public Supply	4
Dewatering	4
Commercial	2
Industrial	1
Total	270

Well Depth

Less than 15 m	58
15 to 30 m	8
Greater than 30 m	20
Unknown or no well	184
Total	270

Although four municipal wells are present as per the MECP well records, only three active municipal wells were found to be operating within the Study Area. The MECP well locations are presented in Figure 9 and cross sections of select the MECP wells are presented in Figure 10.

The approximate depth to groundwater, based on water well records in the local area and previous investigations completed at the Site, varies from 0.6 to 22 m below ground surface. Locally, the groundwater level is expected to follow the topography and groundwater flow is towards the tributaries that traverse the Site. Regionally, groundwater is expected to flow to the south towards Lake Ontario. Site features are presented in Figures 2 to 8.

A review of previous subsurface and ground water monitoring investigations for Caledon East indicates that the ground water table was historically measured at depths between 0.6 to 3.0 mbgs within overburden deposits in the vicinity of Centreville Creek and its tributaries. Ground water was reported to be encountered at depths between 4 and 5 mbgs elsewhere within the shallow aquifer. Artesian conditions are anticipated in wells screened within the intermediate Granite Stone Aquifer Complex, approximately 55 m deep at Caledon East.

3.6 Results of Subsurface Investigation

The fieldwork for this project was carried out on December 12, 2018 and during the period May 07 to June 03, 2019 after obtaining utility clearances and permits. The work was performed in accordance with the lane closure times specified by the Region of Peel and Town of Caledon. The subsurface investigation consisted of the completion of:

- Four foundation boreholes (BH1, BH24, BH64, BH80) along Airport Road in proximity to existing culvert crossings to various depths ranging from 3.5 to 10.7 m below existing grades; and,
- Eighty-three pavement boreholes, seventy-two along Airport Road and thirteen along intersecting roads within the project area each completed to a depth of approximately 1.5 m below existing grades. An additional six boreholes were drilled in the widening areas of Airport Road to a depth of 1.8 m and five boreholes were drilled along the existing lanes of Old Church Road to a depth of 1.5 m.
- Manual excavation of seventy-four test pits to estimate topsoil thickness in the road widening areas.

The boreholes were drilled with truck-mounted drill rigs and also portable drilling equipment supplied and operated by specialist drilling contractors. Terraprobe's staff observed and recorded the drilling, sampling and in-situ testing operations and logged the boreholes.

Groundwater conditions in the open boreholes were observed during the drilling operations and standpipe piezometers consisting of a 50 mm diameter PVC pipe with a slotted screen were installed in boreholes 24A, 64A and 80A to permit longer term groundwater level monitoring. The boreholes were backfilled in accordance with current MTO procedures and Ontario Regulation 903 (as amended). Within the three foundation boreholes, soil samples were obtained at intervals of 0.75 m and 1.5 m depth using a 50 mm outside diameter split spoon sampler in conjunction with Standard Penetrating Testing. In the shallow pavement boreholes samples of soil and granular fill were collected from auger cuttings. The recovered soil samples were visually inspected and recorded in the field and placed in labelled plastic containers for further laboratory testing and analysis including natural moisture content and grain size distribution analysis.

Details of the encountered soil stratigraphy are presented on the borehole logs, in Appendix C, and an overall description of the site stratigraphy is provided below. It should be noted that the stratigraphic boundaries shown on the borehole logs are inferred from non-continuous soil sampling and represent transitions between soil types rather than exact planes of geological change. The subsurface conditions will vary between and beyond the borehole locations.

In summary, topsoil, a flexible pavement and fill material consisting of firm to very stiff silty clay, loose to compact sand and gravel, and very loose to dense silty sand were encountered at the Site. The native overburden deposits consist of firm to hard silty clay till, very loose to very dense sand to sandy silt and, very soft to very stiff clayey silt.

3.6.1 Topsoil

Topsoil layers ranging in thickness from 40 to 250 mm were encountered in the test pits. Topsoil thickness varied between and beyond the test pit locations.

3.6.2 Flexible Pavement

For boreholes completed along the right of way along Airport Road and intersecting streets within the project area, a flexible pavement consisting of asphaltic concrete, underlain by granular material was encountered. Pavement composition on Airport Road ranged from approximately 150 to 235 mm layers of hot mix asphalt, with a granular base/subbase ranging from 525 to 650 mm in thickness. Pavement composition of sideroads that intersect with Airport Road ranged from approximately 75 to 155 mm layers of hot mix asphalt, with a granular base/subbase ranging from 200 to 770 mm in thickness.

3.6.3 Earth Fill

Silty clay fill was encountered at this Site. The locations, thicknesses, depths and base elevations of the silty clay fill are summarized in the following table.

Borehole No.	Fill Thickness (m)	Fill Depth (m)	Fill Base Elevation (masl)
BH 1	1.5	2.4	273.4
BH 24	0.9	1.8	293.0
BH 24A	0.9	1.8	293.1

A 1.4 m thick sand and gravel fill layer was encountered at Borehole 64 extending to a depth of 2.1 m (elevation 286.4 masl) below ground surface.

Silty sand fill was encountered at this Site. The locations, thicknesses, depths and base elevations of the silty sand fill are summarized in the following table.

Borehole No.	Fill Thickness (m)	Fill Depth (m)	Fill Base Elevation (masl)
BH 64A	1.8	2.1	286.6
BH 80	2.2	2.9	313.7
BH 80A	2.2	2.9	313.7

3.6.4 Peat

Layers of amorphous peat were encountered at two culvert locations at this Site. The locations, thicknesses, depths and base elevations of the peat are summarized in the following table.

Borehole No.	Thickness (m)	Depth (m)	Base Elevation (masl)
BH64	0.8	2.9	285.6
BH 64A	1.6	3.7	285.0
BH 80	0.5	3.4	313.2
BH 80A	0.5	3.4	313.2

The natural water content of two samples of peat are 60% and 113% by weight.

3.6.5 Silty Clay Till

Silty clay till deposits were encountered at this Site. The locations, thicknesses, depths and base elevations of the silty clay till deposits are summarized in the following table.

Borehole No.	Thickness (m)	Depth (m)	Base Elevation (masl)
BH 1	1.1	3.5*	272.3
BH 24	1.9	3.7	291.1
BH 24A	1.1	2.9	292.0

*Borehole termination depth

3.6.6 Sand to Sandy Silt

Native deposits with a soil matrix composition that ranges from sand to sandy silt were encountered at this Site. The locations, thicknesses, depths and base elevations of the sand to sandy silt deposits are summarized in the following table.

Borehole No.	Thickness (m)	Depth (m)	Base Elevation (m)
BH 24	4.4	8.1*	286.7
BH 24A	5.2	8.1*	286.8
BH 64	2.3	5.2	283.3
	0.8	6.7	281.8
BH 64A	1.2	4.9	283.8
BH 80	2.9	8.1*	308.5
BH 80A	4.7	8.1*	308.5

*Borehole termination depth

3.6.7 Clayey Silt

Clayey silt deposits were encountered at this Site. The locations, thicknesses, depths and base elevations of the clayey silt deposits are summarized in the following table.

Borehole No.	Thickness (m)	Depth (m)	Base Elevation (m)
BH 64	0.7	5.9	282.6
	4.0	10.7*	277.8
BH 64A	3.2	8.1*	280.6
BH 80	1.8	5.2	311.4

*Borehole termination depth

3.7 Groundwater Levels

Groundwater conditions were observed in the boreholes during and upon completion of drilling. Boreholes 24A, 64A and 80A were instrumented with a 50 mm diameter standpipe piezometer. Summarized below are the groundwater levels that were measured on separate visits after the completion of drilling.

Borehole No	Date	Water Levels	
		Depth (m)	Elevation (m)
24A	June 26, 2019	Dry*	NA
	July 10, 2019	Dry	NA
64A	June 26, 2019	3.1	285.6
	July 10, 2019	3.4	285.3

Borehole No	Date	Water Levels	
		Depth (m)	Elevation (m)
80A	June 26, 2019	2.0	314.6
	July 11, 2019	2.2	314.4

*Piezometer flush mount casing observed to be destroyed during site visit.

The readings taken in the piezometer are stabilised water levels. However, the groundwater level can be expected to fluctuate seasonally and after severe weather events. The groundwater level will also be controlled by the free water level in the watercourses.

3.8 Aquifer Performance Tests

The hydraulic conductivities of the subsurface soil surrounding the screened zone of monitoring wells were determined based on single well response tests, as per the field investigation completed on June 26, 2019. This test involves the rapid removal of water from a single well and monitoring the water level recovery. This test was carried out in Boreholes 80A. Single well response tests could not be carried out in Borehole 24A because the borehole was dry during both monitoring events. Single Well response tests could not be carried out in Boreholes 64A because there was insufficient water to conduct a reliable test during both monitoring events. The data from the test was analysed using the Bouwer and Rice method. The results of the analysis are presented in Appendix E. The hydraulic conductivities of the strata are:

Borehole No	Well Screen Elevation	Screened Formation	Hydraulic Conductivity (m/s)
24A	290.3 to 287.2	Silty Sand to Sandy Silt	N/A – Well was dry
64A	285.7 to 284.2	Fill, Peat and Sand	N/A – Insufficient water
80A	312 to 310.5	Silty Sand to Sand and Silt	1.14×10^{-7}

Documented values within Freeze and Cherry (1979) for hydraulic conductivity of the investigated strata can be summarized as follows:

- Silty clay (Glacial Till) 10^{-7} m/s to 10^{-9} m/s
- Sand to sandy silt 10^{-3} m/s to 10^{-5} m/s
- Clayey silt 10^{-6} m/s to 10^{-9} m/s

During the geotechnical investigation, the hydraulic conductivity of the subgrade soils at the culvert locations were also estimated using grain size analysis. The estimated hydraulic conductivities are summarized below.

Location	Estimated Ground water Elevation (m)	Estimated Hydraulic Conductivity (m/s)
24A	293.0	Silty Clay Till 1×10^{-8}
		Silty Sand to Sandy Silt 1×10^{-6}
64A	286.5	Silty Sand to Sand & Silt 5×10^{-5}
		Clayey Silt 1×10^{-7}
		Sand 1×10^{-4}
80A	314.5	Silty Sand to Sand & Silt 5×10^{-5}
		Clayey Silt 1×10^{-7}

Based on a review of the hydraulic conductivities calculated from the rising head test and grain size analysis and comparison to the published values associated with the geological material tested, a design hydraulic conductivity of 1×10^{-6} was utilised for the sandy silt to silty sand soils for the purpose of preliminary dewatering calculations.

3.9 Site Inspection to Assess Hydrogeological Features

A detailed inspection of the Site was conducted on November 21, 2017 to assess the presence of features which are significant from a hydrogeological view point. In particular, the Site was inspected to assess the following:

- The presence of drainage features or depressions that may allow for ponding and significant or enhanced water infiltration.
- Areas of seasonally high groundwater levels and/or water courses that may receive groundwater discharge and seepage.

The results of the inspection indicate that there are several tributary crossings located across the Site and the Site topography generally slopes towards the south. Drainage ditches are present along several locations adjacent to the municipal road and it is anticipated that surface water flows along the ditches and into the local tributaries. Across the majority of the Site, the surrounding areas are covered with vegetation.

Domestic or municipal water wells were not observed during the site reconnaissance. The Site consists mainly of an asphalt paved roadway with pedestrian sidewalks on the west and east sides where the roadway passes through the village of Caledon East. Catch basins and municipal services were also noted within the village of Caledon East.

4.0 DISCUSSION AND ANALYSIS

4.1 Summary of Hydrogeological Conditions

The results of the investigation indicate the following hydrogeological features:

- A private potable water supply well exists within the Site. It is expected that private wells have been decommissioned in the area surrounding East Caledon and properties are being serviced by municipal sewer and potable water. The remainder of the study area may be serviced by private wells.
- A portion of the Site is identified within Settlement Areas of the Oak Ridges Moraine Plan and the Protected Countryside area of the Greenbelt Plan. The site falls within a groundwater recharge management area (Wellhead Protection Zone A, B and C) in the north area of the project. A reduction of recharge following construction is not anticipated based on the nature of the proposed works (i.e. road widening and culvert extensions).
- Soils at the Site can be characterized as deposits of fill overlying silty sand to sandy silt deposits overlying silty clay glacial till. Glacial till deposits are considered to be of low permeability. More permeable sand layers were encountered within the silty clay till that may facilitate lateral groundwater flow pathways.
- Stabilized groundwater levels at the Site were observed at an elevation of 285.6 masl (depth of 3.1 m below existing grade) at the central section of the Site and at an elevation of 314.6 masl (depth of 2.0 m below existing grade) at the northern section of the Site.

- Based on a review of the in-situ test results, the grain size analysis and published hydraulic conductivities for the investigated soils, the hydraulic conductivity considered for sandy silt to silty sand soils is 1×10^{-6} m/s.
- As noted by Peel Region, an artesian pond is present at 16399 Airport Road, a private property within the study area. Additional ground water instrumentation is recommended in the vicinity of this pond to investigate local ground water and surface water conditions and to evaluate the potential for impacts from construction. This hydrogeological work shall be completed during the detailed design stage.
- As noted by Peel Region, a meltwater channel runs from Boyce Creek to south of the Caledon East urban area. The hydraulic characteristics of this meltwater channel shall be investigated further during detailed design. The potential exists for high dewatering volumes in areas north of Walker Road (i.e. Culvert No. 1) which is in the vicinity of the meltwater channel.

4.2 Proposed Development Plan

The following culverts were identified as requiring replacements:

- **Culvert No. 1: Station 17+145:** Tributary of Centreville Creek, crossing Airport Road approximately 80 m north of Huntsmill Drive;
- **Culvert No. 3: Station 15+750:** Centreville Creek, crossing Airport Road approximately 25 m north of Mountcrest Road;
- **Culvert No. 7: Station 12+360:** Tributary of the West Humber River approximately 500 m south of Castlederg Sideroad; and
- **Culvert No. 9: Station 9+960:** Tributary of Salt Creek, crossing at approximately 95 m north of King Street.

Culverts 6, 7 and 8 were also identified for replacement. The dewatering volumes and zone of influence associated with the replacement of Culverts 6, 7 and 8 shall be assessed during detail design.

Culverts 1, 3 and 7 will be replaced with either open footing or concrete box culverts. Culvert 7 will be a 825 mm CP replacement. It was assumed that excavations will extend at least to the founding elevations recommended in the geotechnical report as reported below.

Summary of Preliminary Culvert Footing Depths

Culvert ID	Location	Ground Surface Elevation (masl)	Estimated Excavation Base Elevation (masl)	Design Groundwater Elevation (masl)
Culvert No. 1	17+145	316.6	At or below 313.2	314.7
Culvert No. 3	15+750	288.7	At or below 285.0	288.1
Culvert No. 7	12+360	294.9	At or below 292.0	Below excavation base

Based on topographic drawings of the Site, provided by IBI on June 19, 2019, it was assumed that the invert elevation of Culvert No. 9 is 275.0 masl.

The culvert installations will be carried out in open cut excavations that will require temporary protection systems aligned parallel to Airport Road to permit construction staging i.e. partial construction of the culverts while maintaining traffic on Airport Road. Horizontal over-excavations of up to 1 m in plan area were

considered to facilitate construction and it was assumed that surface water within the watercourses will be temporarily diverted via temporary culvert/cofferdam arrangements.

The following table summarizes the excavation geometries, and the areas of the excavation base for the respective culverts. This data was used to carry out dewatering assessments for preliminary designs with the understanding that further refinements will be required during detailed design.

Summary of Excavation Geometries

Culvert ID	Width (m)	Length (m)	Plan Area of Excavation (m ²)
Culvert No. 1	5.7	13.1	88.2
Culvert No. 3	14	10.2	223.3
Culvert No. 7	3.9	12.4	60.0
Culvert No. 9	2.9	25.7	16.1

4.3 Construction Dewatering Volumes

Based on the excavation geometries as well as the subsurface soil and groundwater data, dewatering volumes were calculated based on the assumption that the groundwater table will be drawn down and maintained at a depth of 1 m below the base of excavations to permit construction in reasonably dry conditions. The dewatering conditions are summarized in the following table:

Summary of Dewatering Conditions

Culvert ID	Location	Design Groundwater Elevation (masl)	Bottom of Excavation (masl)	Dewatering Groundwater Target (masl)
Culvert No. 1	17+145	314.71	313.2	312.7
Culvert No. 3	15+750	288.13	285	284.5
Culvert No. 7	12+360	NA	292	291.5
Culvert No. 9	9+960	NA	275	274.5

Dewatering volumes were estimated following a Darcy analysis approach. Groundwater gradients were estimated at 0.1 as it is anticipated that gradients will be low because of the generally low permeability glacial till present across the Site. A safety factor of 1.5 was incorporated into the calculated dewatering volumes to account for potential variations in groundwater levels and hydraulic conductivity at the Site.

The estimated dewatering volume for simultaneous excavations of Culverts 1 and 3 is approximately 156,500 L/day. Negligible groundwater seepage is anticipated for excavations made at the sites of Culverts 7 and 9 because the groundwater level is expected to be located below the proposed excavation depths. The dewatering system should also be designed to accommodate a typical 2-year design storm event which will yield approximately 11,000 L/day. Therefore, it is estimated that a dewatering volume of 167,500 L/day should be considered for preliminary designs.

Based on the estimated dewatering volume, a posting to the MECP Environmental Activity and Sector Registry (EASR) will be required. Posting to the EASR is required for construction dewatering activities ranging from 50,000 L/day to less than 400,000 L/day.

4.4 Assessment of Potential Impacts

4.4.1 Discharge of Pumped Groundwater

The dewatering methodology is the contractor's responsibility. However, it is anticipated that groundwater control can be achieved by pumping from filtered sumps installed at the base of excavations. The discharge location should be established prior to the commencing dewatering activities and it is anticipated that groundwater discharge can be directed via overland flow to the various tributaries crossing the Site or to the municipal sewer system (sanitary or storm). Prior to discharge into the municipal sewer a discharge permit agreement with the Regional Municipality of Peel would be required and water quality will have to comply with discharge By-Laws. For discharge to surface water bodies, water quality compliance with Provincial Water Quality Objectives (PWQO) would have to be confirmed. Treatment of groundwater shall meet the discharge standards of the discharge receiver.

Notwithstanding the above, the contractor is also responsible for preparing and adhering to an approved water quality sampling and sediment control plan. The dewatering system must also include appropriate filters to prevent the pumping of fines and loss of ground during the dewatering activities. Sediment control should include, but not be limited to, filtered sumps, filter socks and rock check dams/hay bales or temporary settlement ponds. Daily monitoring of dewatering discharge should be carried out to verify that the discharge is visually clear and free of suspended solids, sheens or foam. Detailed dewatering records should also be maintained by the contractor with information on dewatering locations, duration and volume of pumping and timing for open cut excavations.

4.4.2 Zone of Influence

The zone of influence was calculated based on the estimated groundwater taking rate, the average hydraulic conductivity recorded at the Site, and the required drawdown from anticipated static shallow groundwater levels. The zone of influence calculation is as follows:

Equation: $R_0 = 3000 * dH * K^{0.5}$

Where dH is the dewatering thickness (m)

K is the hydraulic conductivity (m/s)

The maximum estimated zone of influence surrounding the dewatering work is a radial distance of approximately 5 to 10 m measured from the perimeter of open excavations. A reassessment of the zone of influence should be completed during detail designs.

The zone of influence is expected to be of limited extent and does not include structures, buildings and associated private servicing (i.e. private water supply wells and septic beds). Potential sources of contamination were not noted within the anticipated zone of influence (i.e. underground fuel tanks, dry cleaning operations, fuel storage).

4.4.3 Geotechnical Considerations

The Site is located partially within an urban area with mixed commercial and residential land uses and natural areas consisting largely of vegetated fields and wetlands to the northern extents of the Site. The anticipated zone of influence for the surrounding area in which dewatering is expected is not expected to include existing structures and buildings but further assessments should be carried out at the detail design stage.

Settlement of structures and underground services are not expected to be a major concern because of the limited extent of the zone of influence of the expected dewatering works. The potential for settlement and ground loss can be mitigated by ensuring that the dewatering system is designed to preclude the transport and removal of sediment and fine soils.

4.4.4 Surface Water, Wetlands and Areas of Natural Significance

Centreville Creek and one of its tributaries cross the Site and as indicated previously, the groundwater control activities will result in localized drawdown of the groundwater table. Since tributary crossings are situated within the zone of influence, there is a potential that the nearby surface water features will be affected by the dewatering activities. Monitoring of surface water bodies is recommended during construction and mitigation measures from the dewatering operations should be implemented if significant impacts are observed within surface water bodies. Monitoring should include visual inspections, total suspended solids, water depths, and flow rates.

There is also a potential for the surface water to contribute to additional dewatering volumes due to higher infiltration rates near the water course. Since the aquifer to be dewatered is unconfined, the additional contribution of water may affect the dewatering volume substantially during precipitation events. Groundwater is also expected to flow towards the tributary crossings within the Site locally and regionally south towards Lake Ontario. It is expected that the majority of surface run-off will be directed towards these tributaries crossing Airport Road.

4.4.5 Local Wells and Zone of Influence

Local wells were not identified within the expected zone of influence of dewatering works. The dewatering zone of influence is expected to be minimal and will not impact wells that may be present in the vicinity of the Site.

4.5 Additional Studies

It is recommended that the following issues be considered during detailed design:

- Carry out additional field investigations where necessary, to refine the preliminary recommendations provided herein;
- Carry out a review of Peel Region and Town of Caledon geotechnical and hydrogeological investigations, specifically regarding the artesian pond at 13699 Airport Road to further elaborate on the hydrogeological and geotechnical characterization of the Site and Study Area and refine the recommendations provided in this report;
- Conduct an updated well survey to assess baseline water levels and ground water quality for private water supply wells situated within a 500 m radius of the site as part of investigations for detailed design.
- Confirm and further refine the hydrogeological recommendations based on the preferred alternative;
- Complete a water balance for the Site and proposed construction activities, and,
- Complete more rigorous assessments of dewatering requirements and the zone of influence where deep excavations are required.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions of the investigation are:

- Soils at the Site can be characterized as deposits of fill overlying silty sand to sandy silt deposits atop silty clay glacial till. Glacial till deposits are considered to be of low permeability. More permeable sand layers were encountered within the silty clay till which may allow for local lateral groundwater flow pathways over limited areas of the Site.
- Stabilized groundwater levels at the Site were observed at an elevation of 285.6 m (depth of 3.1 m below existing grades) at the central section of the Site and at an elevation of 314.6 masl (depth of 2.0 m below existing grades) at the northern section of the Site.
- Based on a review of the in-situ tests, the grain size analysis and published hydraulic conductivities for the investigated soils, the hydraulic conductivity considered for sandy silt to silty sand soils is 1×10^{-6} m/s.
- A private well survey was completed for properties situated within a 500 m radius of the Site. Although one response was received, it is expected that active private wells including three municipal wells are present within the study area. Properties within East Caledon are being serviced by municipal sewer and potable water.
- A portion of the Site is located within an area defined as the Oak Ridges Moraine (ORM), and is generally within the Settlement and Rural Settlement Areas of the ORM Plan and the Protected Countryside Area of the Greenbelt Plan. The Environmentally Sensitive Area matches the Natural Core Area within the ORM Plan. The ORM extends from the north boundary of the Site to just north of Boston Mill Road. The Site is identified as falling within a wellhead protection zone and is subject to source water impact protection criteria. A reduction of water supply and recharge following construction is not anticipated based on the nature of the proposed works (i.e. road widening and culvert extensions).

The following dewatering requirements are expected given the requirements for culvert replacement and improvements at the Site:

- Dewatering is anticipated to be required for Culverts 1, 3, 7 and 9 and it is envisaged that open cut excavations will be required extending to undisturbed competent native soils.
- For preliminary design purposes the estimated water taking volume from excavations required to install Culverts 1 and 3 simultaneously is approximately 156,500 L/day. The dewatering system should also be designed to accommodate a typical 2-year design storm event (32 mm rainfall event) which will generate approximately 11,500 L/day, hence resulting in a total anticipated dewatering volume of approximately 168,000 L/day.
- Negligible seepage into excavations is anticipated at Culverts 7 and 9 since the groundwater level is estimated to be below the base of excavation.
- It is expected that construction dewatering activities will require a posting to the Ontario Ministry of the Environment Conservation and Parks (MECP) Environmental Activity and Sector Registry (EASR). Posting to the EASR is required for construction dewatering activities where the dewatering volume is more than 50,000 L/day and less than 400,000 L/day.
- It is expected that construction dewatering activities will not require an application to the Ontario Ministry of the Environment Conservation and Parks (MECP) for a Permit to Take Water (PTTW). A PTTW is only required for dewatering volumes that exceed 400,000 L/day.

- The dewatering zone of influence is expected to range from about 5 to 10 m measured horizontally from the perimeter of open excavations. Potential sources of contamination are not expected within dewatering zones of influence.

The following recommendations for dewatering and further investigations are provided:

- Discharge of pumped groundwater has not been assessed as part of this investigation. Confirmation that groundwater meets quality criteria for discharge into the municipal sewer (Region of Peel Sewer Use By-Laws) or to surface water (Provincial Water Quality Objectives) should be carried out at the detail design stage.
- The design of a dewatering system and associated sediment control plan is the contractor's responsibility. It is anticipated that dewatering can be achieved by pumping from strategically placed filtered sumps within the base of excavations.
- Where necessary, additional field investigations should be carried out to further refine the recommendations presented herein based on the detail design concepts. A more rigorous assessment of dewatering requirements and zone of influence calculations is recommended for the detailed designs.

6.0 LIMITATIONS AND RISK

6.1 Procedures

This investigation has been carried out using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by Terraprobe and other engineering practitioners, working under similar conditions and subject to the time, financial and physical constraints applicable to this project. The discussions and recommendations that have been presented are based on the factual data obtained by Terraprobe.

It must be recognized that there are special risks whenever engineering or related disciplines are applied to identify subsurface conditions. Even a comprehensive sampling and testing programme implemented in accordance with the most stringent level of care may fail to detect certain conditions. Terraprobe has assumed for the purposes of providing design parameters and advice, that the conditions that exist between sampling points are similar to those found at the sample locations. The conditions that Terraprobe has interpreted to exist between sampling points can differ from those that actually exist.

It may not be possible to drill a sufficient number of boreholes or sample and report them in a way that would provide all the subsurface information that could affect construction costs, techniques, equipment, and scheduling. Contractors bidding on or undertaking work on the project should be directed to draw their own conclusions as to how the subsurface conditions may affect them, based on their own investigations and their own interpretations of the factual investigation results, cognizant of the risks implicit in the subsurface investigation activities so that they may draw their own conclusions as to how the subsurface conditions may affect them.

6.2 Changes in Site and Scope

It must also be recognized that the passage of time, natural occurrences, and direct or indirect human intervention at or near the Site have the potential to alter subsurface conditions. Groundwater levels are particularly susceptible to seasonal fluctuations.

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It must also be recognized that the passage of time, natural occurrences, and direct or indirect human intervention at or near the Site have the potential to alter subsurface conditions. Groundwater levels are particularly susceptible to seasonal fluctuations.

The discussion and preliminary recommendations are based on the factual data obtained from investigations made by Terraprobe and are intended for use by the owner and its retained designers in the design phase of the project. If there are changes to the project scope and development features the interpretations made of the subsurface information, the geotechnical design parameters and comments relating to constructability issues and quality control may not be relevant or complete for the revised project. Terraprobe should be retained to review the implications of such changes with respect to the contents of this report.

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Terraprobe Inc.



Mariam Al Gailani, EIT.



Paul Raepple., P.Geo.
Sr. Hydrogeologist

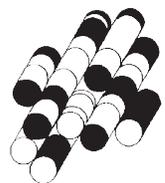


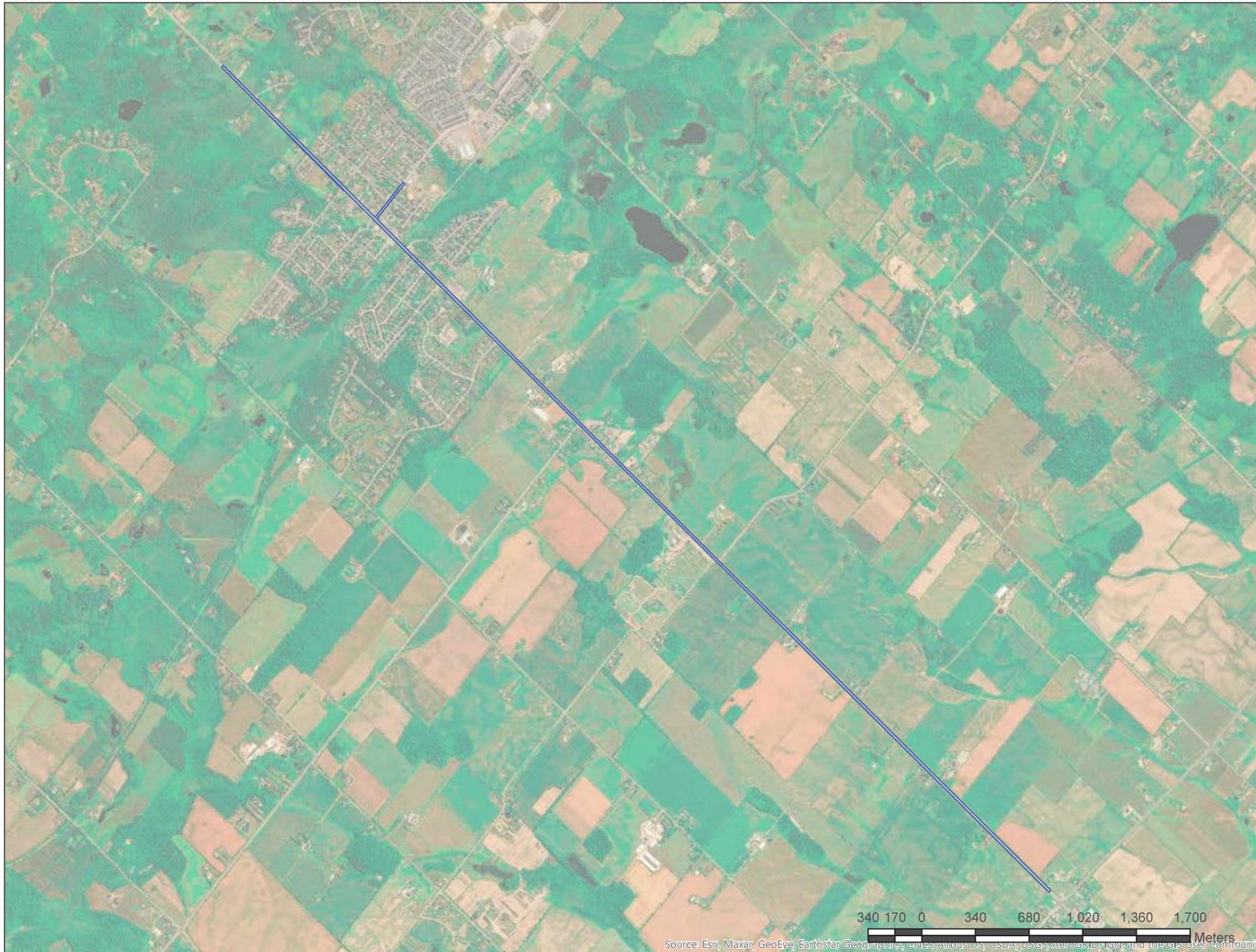
Rehman Abdul, P.Eng.
Principal



FIGURES

TERRAPROBE INC.

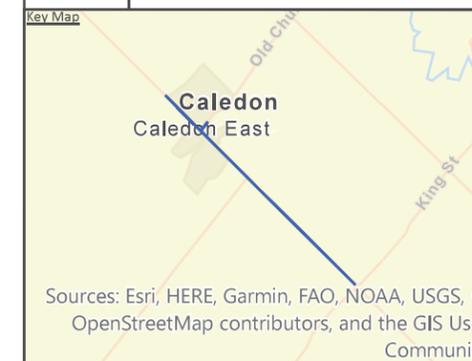




Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



References:
 ESRI, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus Ds, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Basemaps



Notes:

Legend:

Approximate Site Boundary

Project Title:
 Hydrogeological Assessment

Site Location:
 Airport Road,
 Caledon, Ontario

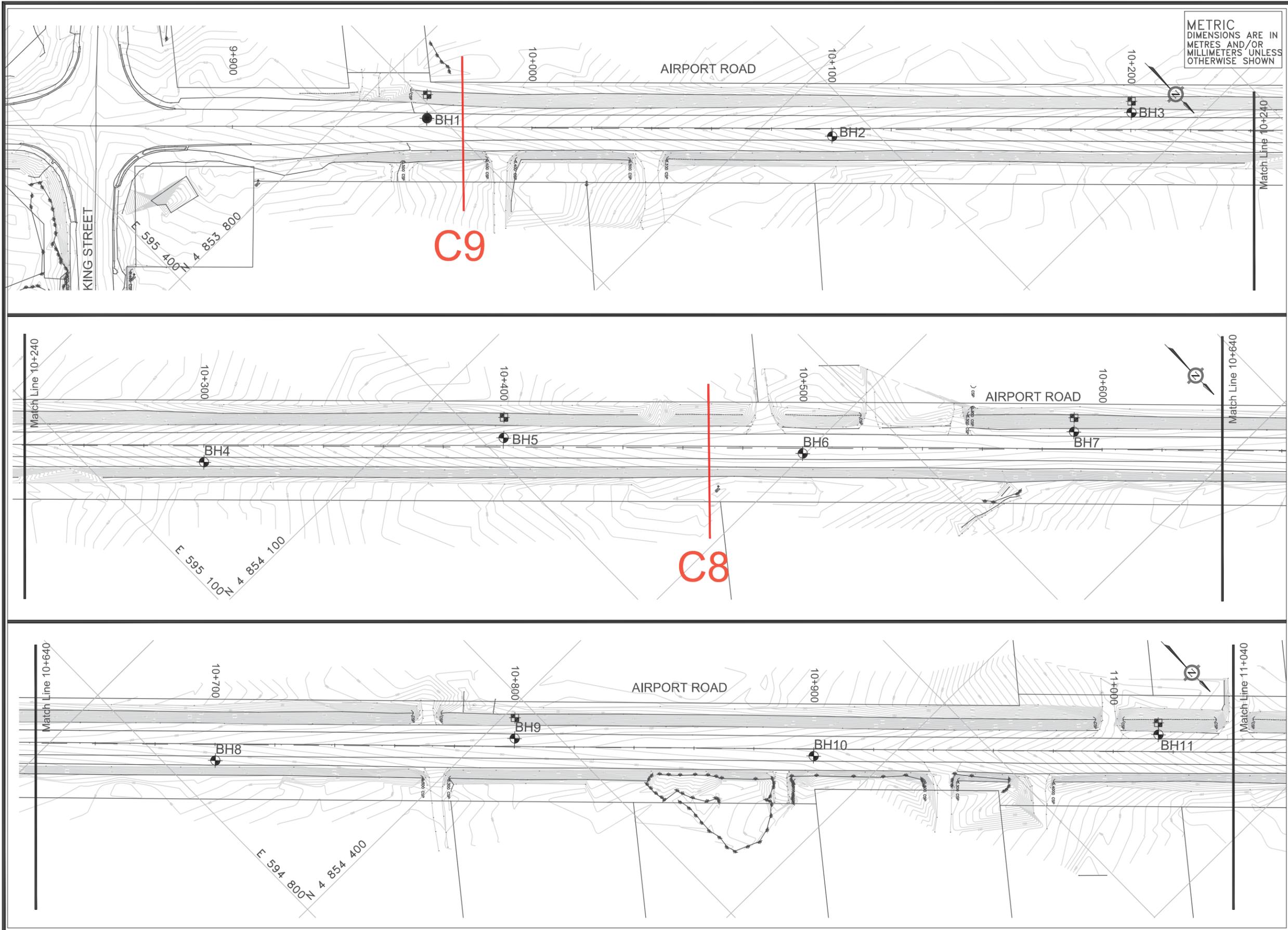
Figure Title:
 Site Location Plan

Designed By: MA	File No.: 1-17-0714-46
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Drawn By: SSK	Scale: As Shown
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Reviewed By: PR	Figure No.: 1
Date: December 2020	

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METRIC DIMENSIONS ARE IN METRES AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

AIRPORT ROAD IMPROVEMENTS
FROM KING STREET TO HUNTSMILL DRIVE,
TOWN OF CALEDON, ONTARIO



BOREHOLE LOCATION PLAN

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11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

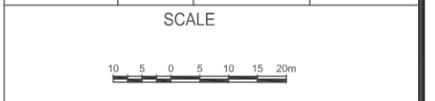


KEY PLAN
Not to Scale

LEGEND

- Foundation Borehole
- Pavement Borehole
- Test Pit

BH No	ELEV. (m)	COORDINATES (UTM, NAD83, ZONE17)	
		NORTHING (m)	EASTING (m)
BH1	275.8	4 853 819.6	595 303.6



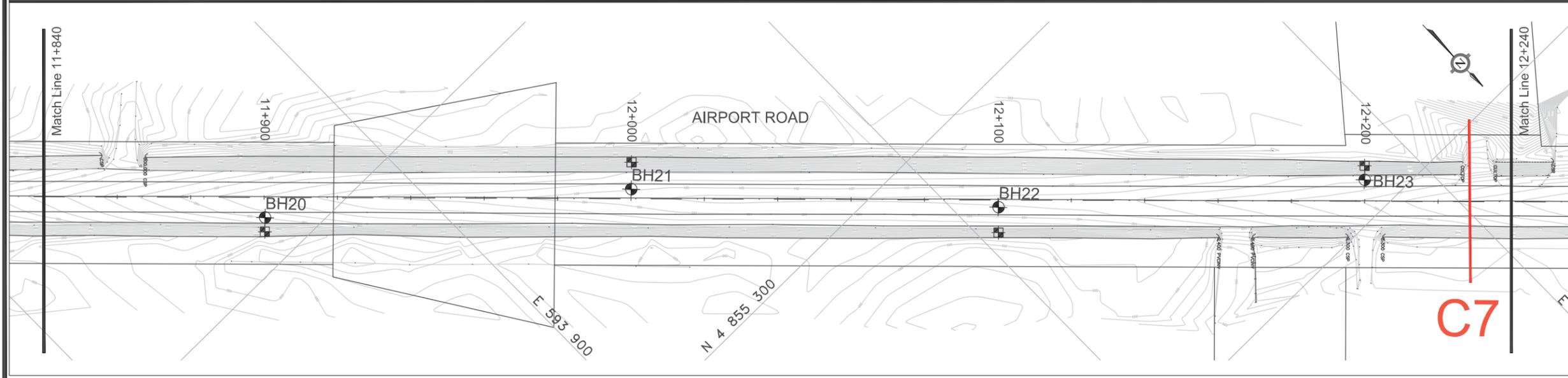
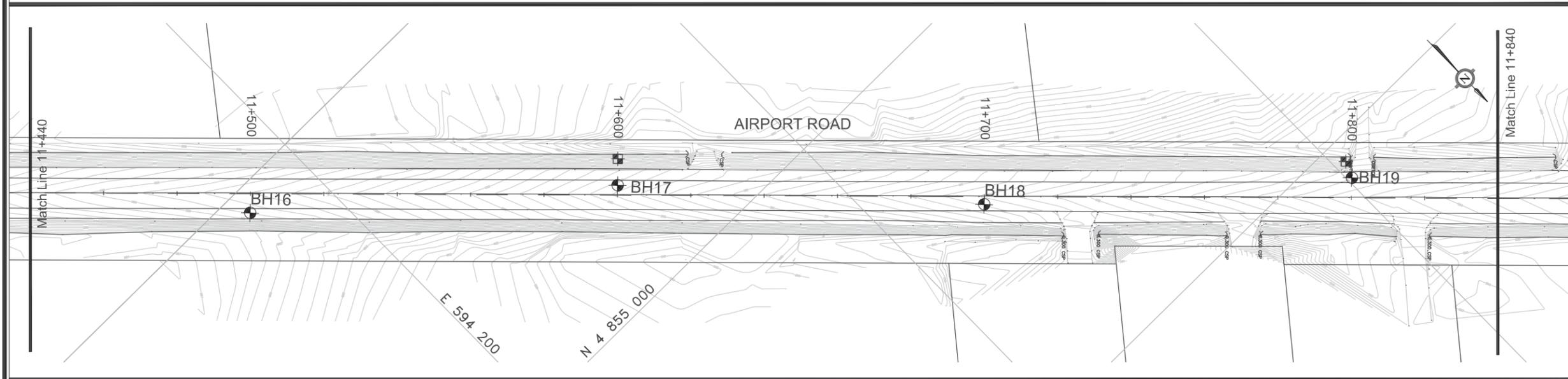
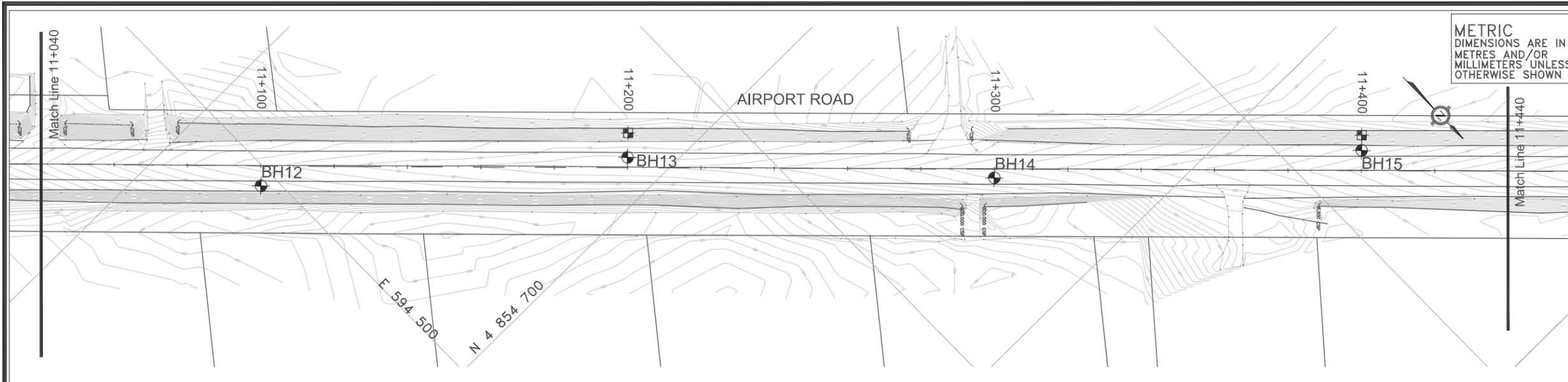
NOTE
This drawing is for subsurface information only. Surface details and features are for conceptual illustration. The subsurface conditions can be expected to vary between and beyond the borehole locations.

REFERENCE
Drawing provided in digital format by IBI Group received June 19, 2019.

DATE	BY	DESCRIPTION

DESIGN RA	PROJECT No. 1-17-0714	DATE July 2019
DRAWN KC	CHK RA	GEOCRE No.: -
		FIGURE No. 10

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AIRPORT ROAD IMPROVEMENTS
FROM KING STREET TO HUNTSMILL DRIVE,
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BOREHOLE LOCATION PLAN

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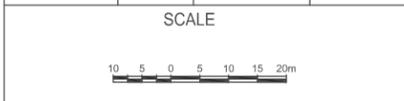
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KEY PLAN
Not to Scale

LEGEND	
	Foundation Borehole
	Pavement Borehole
	Test Pit

BH No	ELEV. (m)	COORDINATES (UTM, NAD83, ZONE17)	
		NORTHING (m)	EASTING (m)

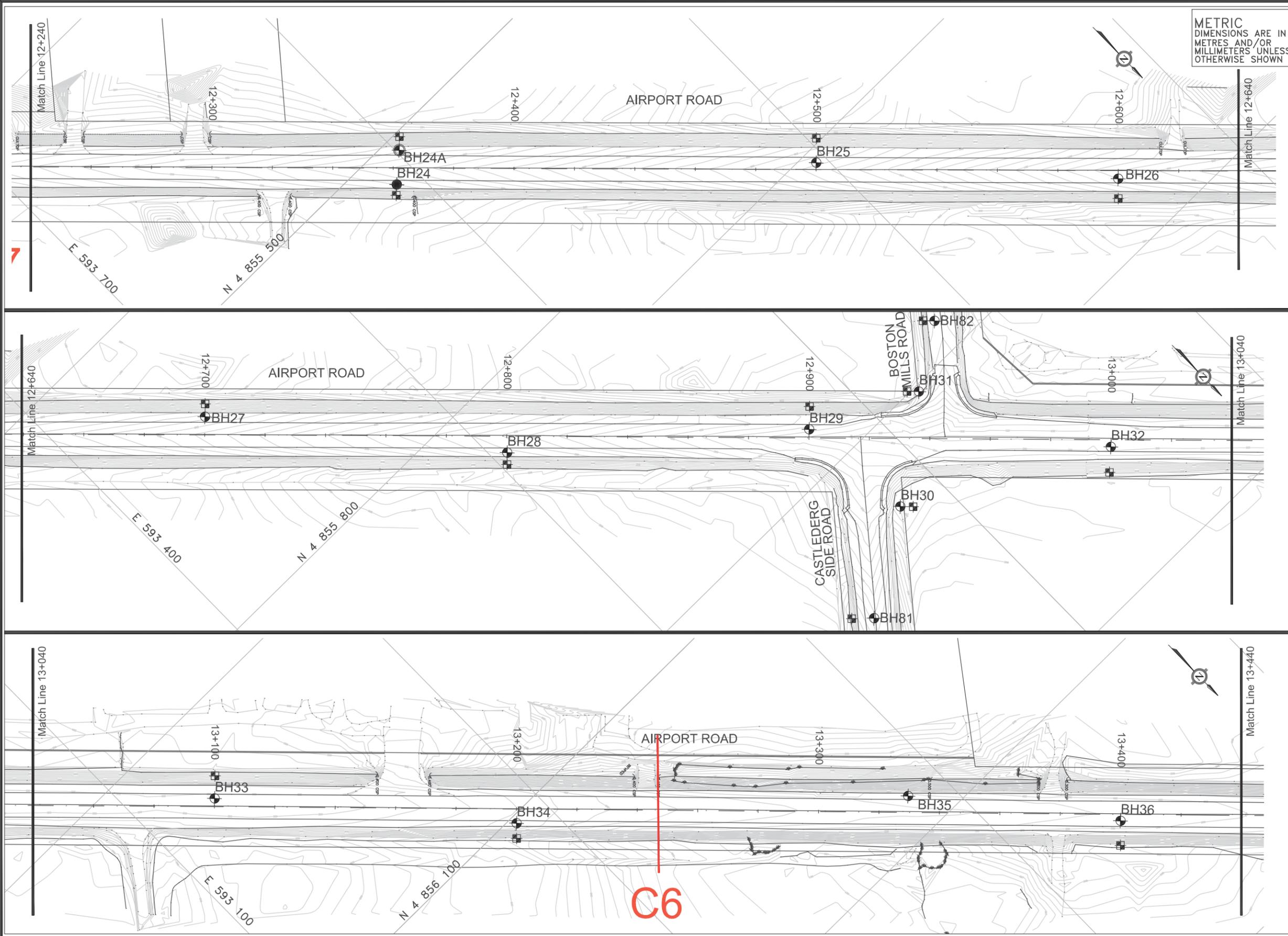


NOTE
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REFERENCE
Drawing provided in digital format by IBI Group received June 19, 2019.

REVISIONS			
DATE	BY	DESCRIPTION	

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METRIC DIMENSIONS ARE IN METRES AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

AIRPORT ROAD IMPROVEMENTS
FROM KING STREET TO HUNTSMILL DRIVE,
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BOREHOLE LOCATION PLAN

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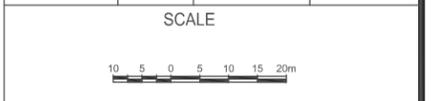


KEY PLAN
Not to Scale

LEGEND

- Foundation Borehole
- Monitoring Well
- Pavement Borehole
- Test Pit

BH No	ELEV. (m)	COORDINATES (UTM, NAD83, ZONE17)	
		NORTHING (m)	EASTING (m)
BH24	294.8	4 855 512.3	593 607.5
BH24A	294.8	4 855 504.8	593 599.0



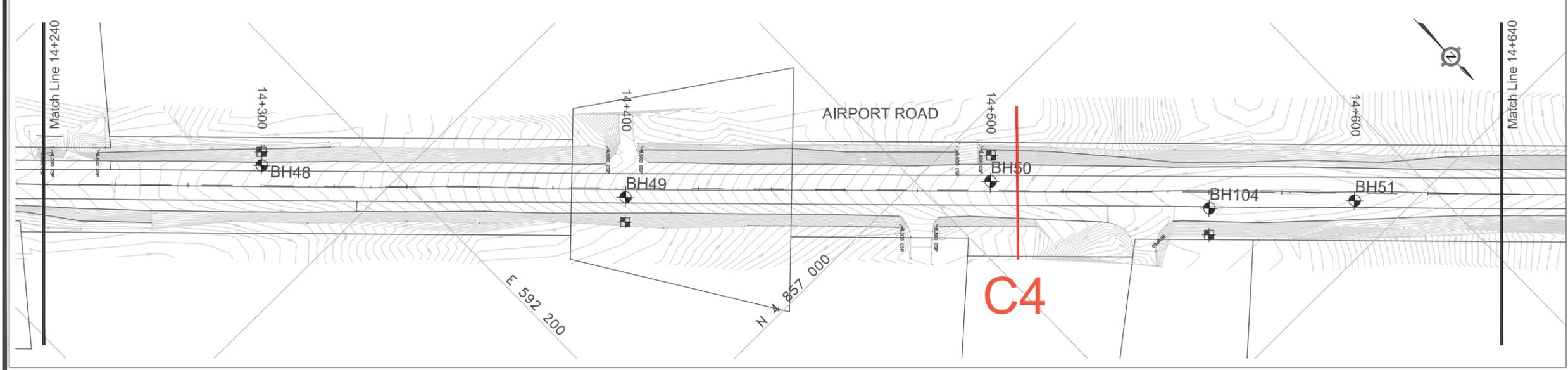
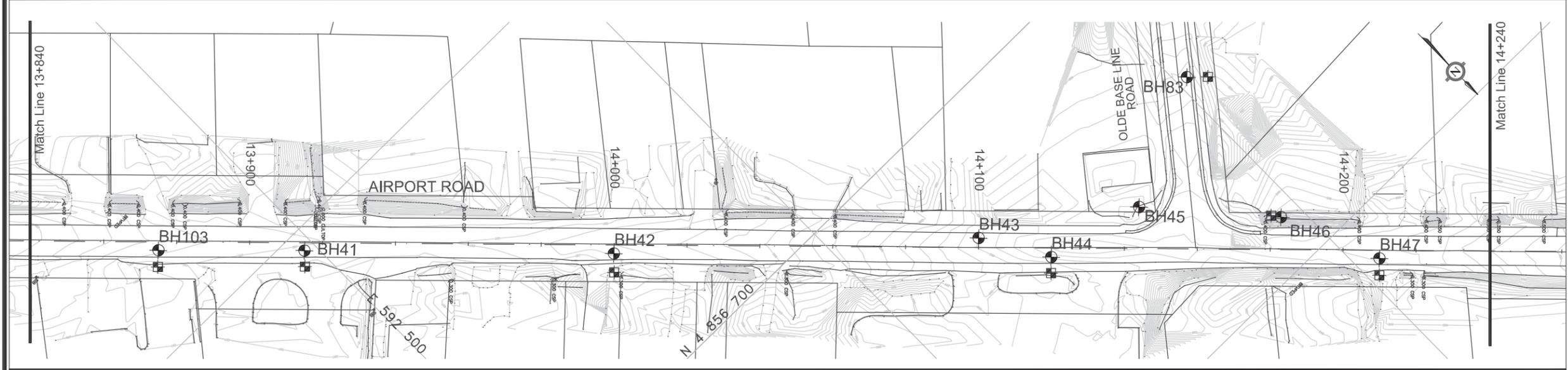
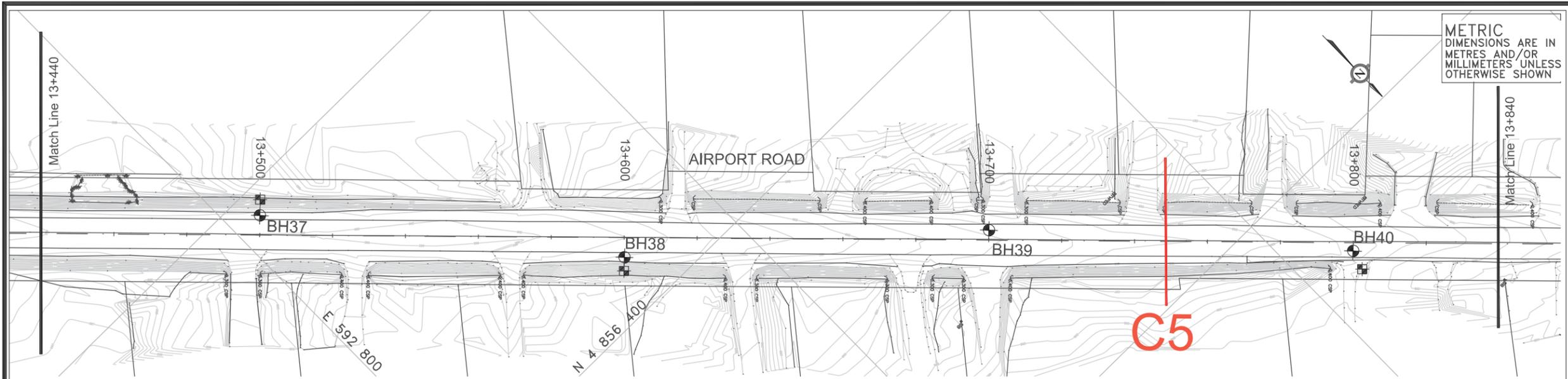
NOTE
This drawing is for subsurface information only. Surface details and features are for conceptual illustration. The subsurface conditions can be expected to vary between and beyond the borehole locations.

REFERENCE
Drawing provided in digital format by IBI Group received June 19, 2019.

REVISIONS	DATE	BY	DESCRIPTION

DRAWN KC CHK RA GEORES No.: - FIGURE No. 12

Z:\1-Project Files\2017\1-17-2017-14 - Airport Road, King-Huntsmill, Caledon\46 - Hydrogeological\A, Dwg, Logs\AutoCAD\1-17-2017-14 - Airport Rd - 3D - King St - Huntsmill - 16-4360 - Standard\1-17-2017-14 - Airport Rd - 3D - King St - Huntsmill - 16-4360.dwg, SSK



METRIC DIMENSIONS ARE IN METRES AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

AIRPORT ROAD IMPROVEMENTS
FROM KING STREET TO HUNTSMILL DRIVE,
TOWN OF CALEDON, ONTARIO



BOREHOLE LOCATION PLAN

IBI GROUP
100-175 Galaxy Boulevard
Toronto ON M9W 0C9 Canada
tel 416 679 1930 fax 416 675 4620
ibigroup.com

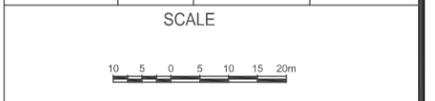
Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650



KEY PLAN
LEGEND

- Foundation Borehole
- Pavement Borehole
- Test Pit

BH No	ELEV. (m)	COORDINATES (UTM, NAD83, ZONE17)	
		NORTHING (m)	EASTING (m)



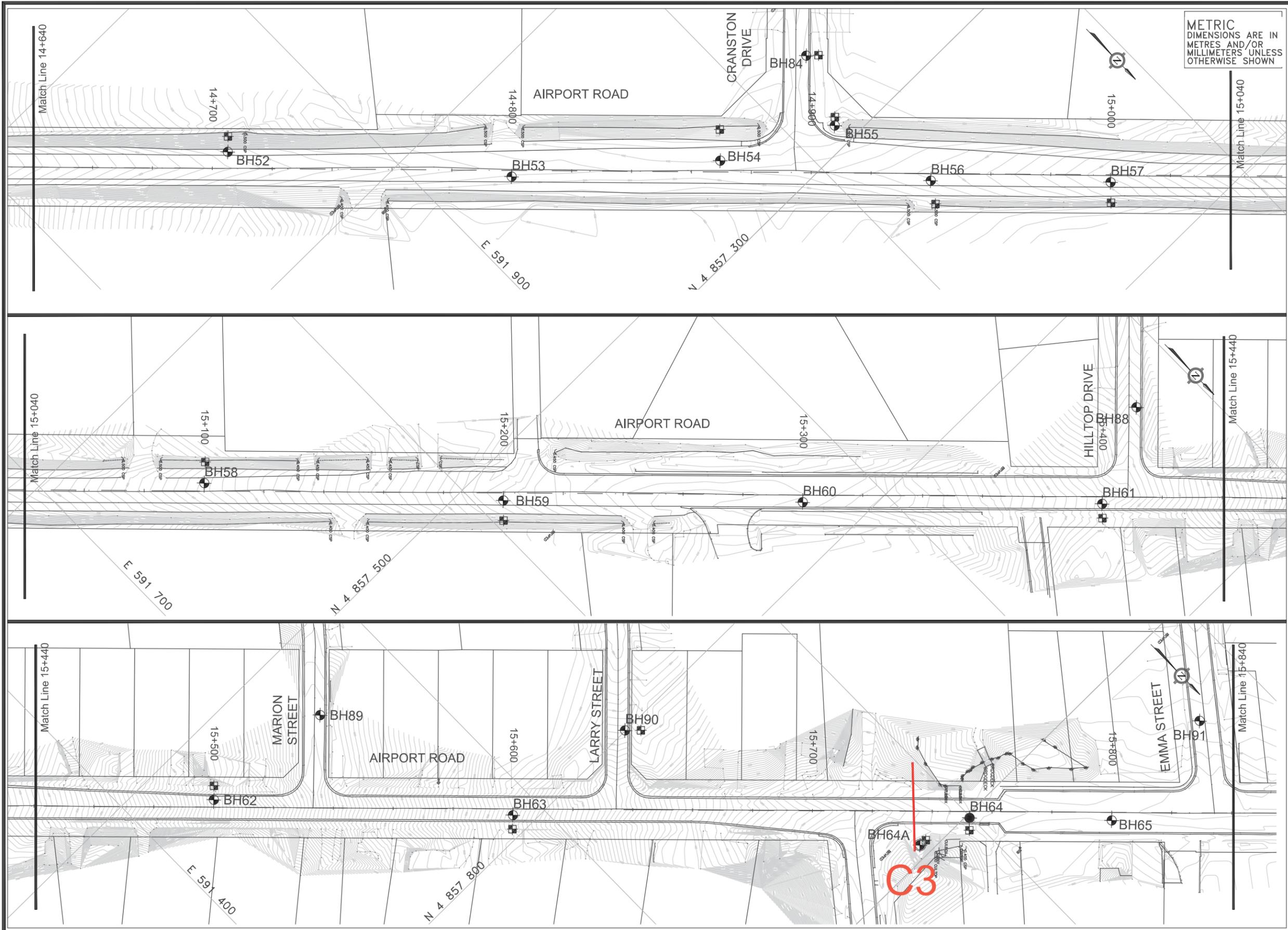
NOTE
This drawing is for subsurface information only. Surface details and features are for conceptual illustration. The subsurface conditions can be expected to vary between and beyond the borehole locations.

REFERENCE
Drawing provided in digital format by IBI Group received June 19, 2019.

DATE	BY	DESCRIPTION

DESIGN RA	PROJECT No. 1-17-0714	DATE July 2019
DRAWN KC	CHK RA	GEORES No.: -
		FIGURE No. 13

Z:\1-Project Files\2017\17-0714 - Airport Road, King-Huntsmill, Caledon\46 - Hydrogeological\A, Dwg. Logs\AutoCAD\17-0714 Airport Rd - 3D - King St - Huntsmill - 16-4360 - Standard\17-0714 Airport Rd - 3D - King St - Huntsmill - 16-4360.dwg, SSK



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AIRPORT ROAD IMPROVEMENTS
FROM KING STREET TO HUNTSMILL DRIVE,
TOWN OF CALEDON, ONTARIO

BOREHOLE LOCATION PLAN

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Toronto ON M9W 0C9 Canada
tel 416 679 1930 fax 416 675 4620
ibigroup.com

Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650



KEY PLAN
LEGEND

- Foundation Borehole
- Monitoring Well
- Pavement Borehole
- Test Pit

BH No	ELEV. (m)	COORDINATES (UTM, NAD83, ZONE17)	
		NORTHING (m)	EASTING (m)
BH64	288.5	4 857 901.2	591 200.4
BH64A	288.7	4 857 896.1	591 218.6

SCALE	
10 5 0 5 10 15 20m	

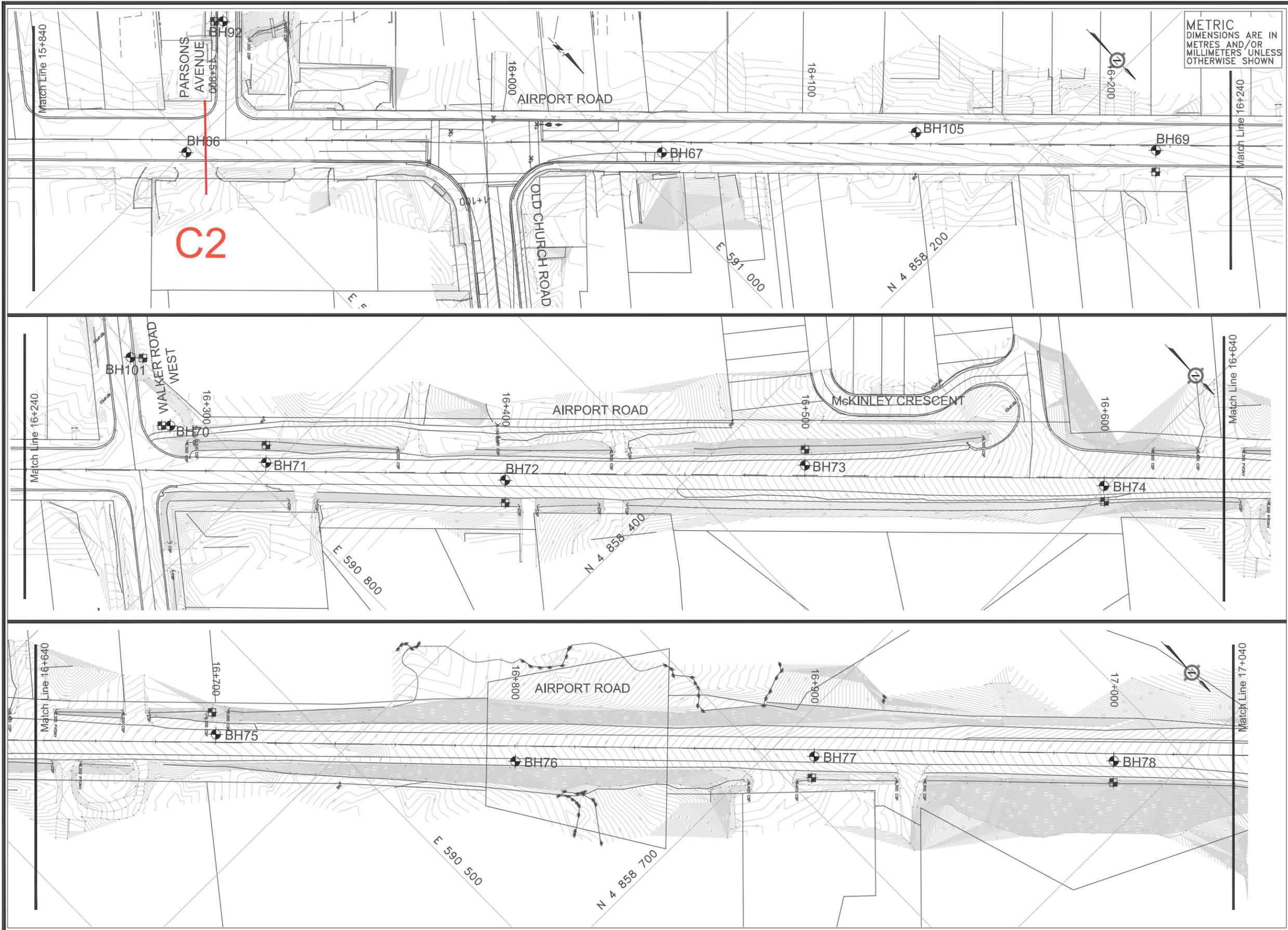
NOTE
This drawing is for subsurface information only. Surface details and features are for conceptual illustration. The subsurface conditions can be expected to vary between and beyond the borehole locations.

REFERENCE
Drawing provided in digital format by IBI Group received June 19, 2019.

REVISIONS			
DATE	BY	DESCRIPTION	

DESIGN RA	PROJECT No. 1-17-0714	DATE July 2019
DRAWN KC	CHK RA	GEORES No.: -
		FIGURE No. 14

Z:\1-Project Files\2017\17-0714 - Airport Road, King-Huntsmill, Caledon\46 - Hydrogeological\46 - Hydrogeological\A, Dvgs, Logs\AutoCAD\17-0714 Airport Rd - 3D - King St - Huntsmill - 16-4360.dwg, SSK



METRIC DIMENSIONS ARE IN METRES AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

AIRPORT ROAD IMPROVEMENTS
FROM KING STREET TO HUNTSMILL DRIVE,
TOWN OF CALEDON, ONTARIO

BOREHOLE LOCATION PLAN

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100-175 Galaxy Boulevard
Toronto ON M9W 0C9 Canada
tel 416 679 1930 fax 416 675 4620
ibigroup.com

Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

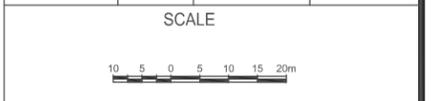


KEY PLAN

LEGEND

- Foundation Borehole
- Pavement Borehole
- Test Pit

BH No	ELEV. (m)	COORDINATES (UTM, NAD83, ZONE17)	
		NORTHING (m)	EASTING (m)



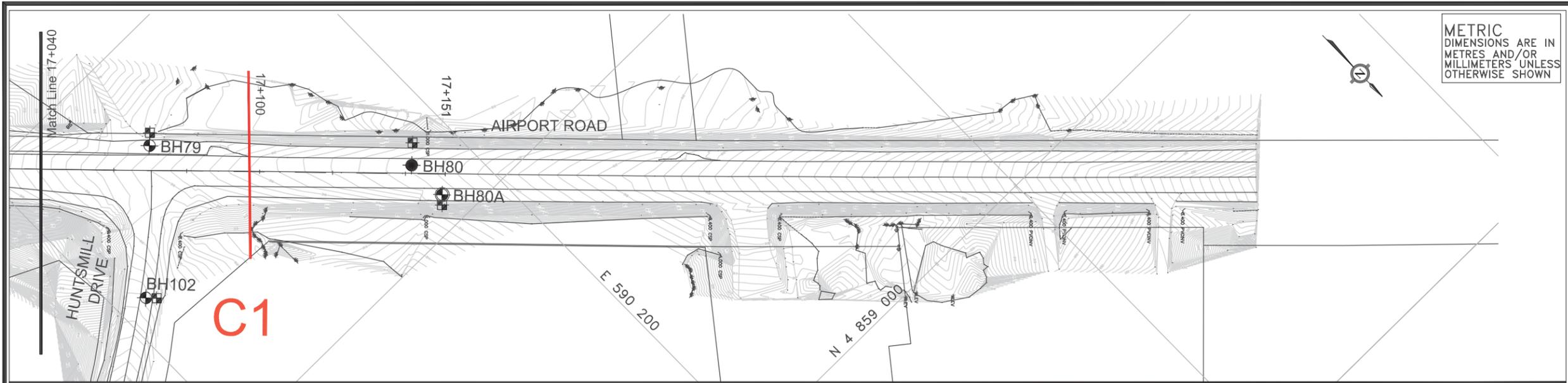
NOTE
This drawing is for subsurface information only. Surface details and features are for conceptual illustration. The subsurface conditions can be expected to vary between and beyond the borehole locations.

REFERENCE
Drawing provided in digital format by IBI Group received June 19, 2019.

REVISIONS	DATE	BY	DESCRIPTION

DESIGN	RA	PROJECT No.	1-17-0714	DATE	July 2019	
DRAWN	KC	CHK	RA	GEOCREs No.:	-	
					FIGURE No.	15

Z:\1-Project Files\2017\17-0714 - Airport Road, King-Huntsmill, Caledon\46 - Hydrogeological\A, Dwg, Logs\AutoCAD\17-0714 Airport Rd - 3D - King St - Huntsmill - 16-4360 - Standard\17-0714 Airport Rd - 3D - King St - Huntsmill - 16-4360.dwg, SSK



METRIC DIMENSIONS ARE IN METRES AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

AIRPORT ROAD IMPROVEMENTS
FROM KING STREET TO HUNTSMILL DRIVE,
TOWN OF CALEDON, ONTARIO

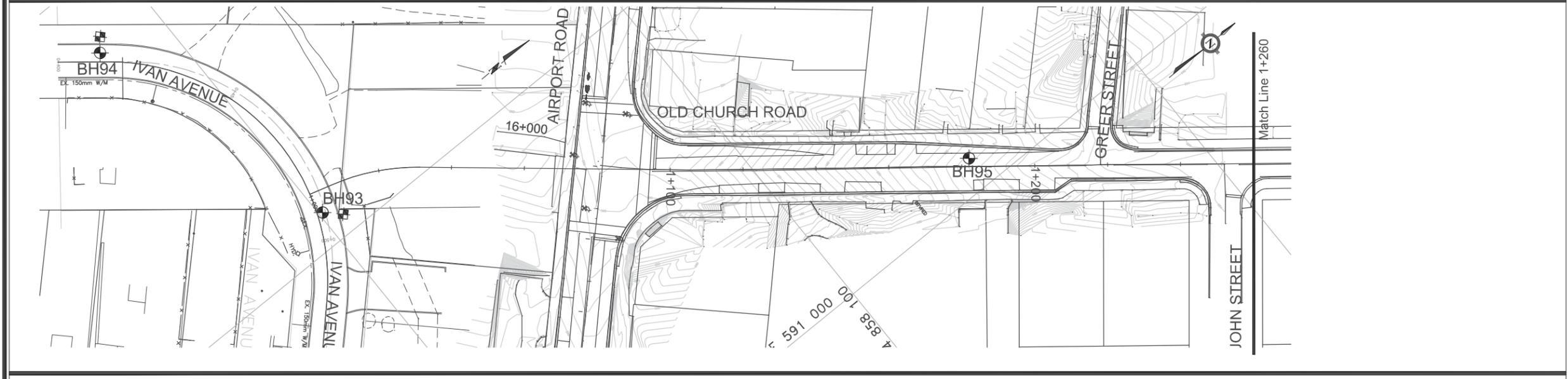
BOREHOLE LOCATION PLAN

IBI GROUP
100-175 Galaxy Boulevard
Toronto ON M9W 0C9 Canada
tel 416 679 1930 fax 416 675 4620
ibigroup.com

Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650



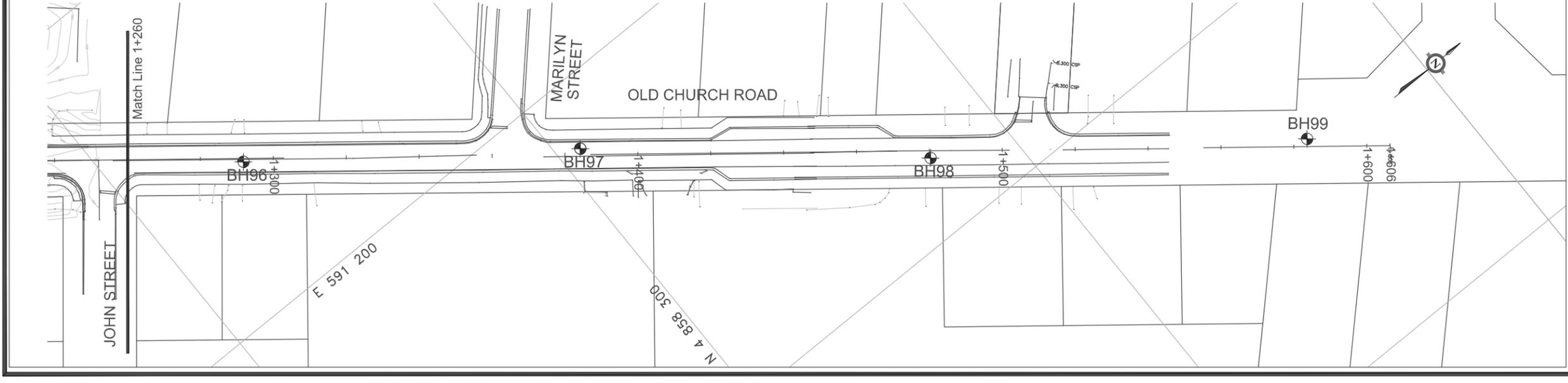
KEY PLAN
Not to Scale



LEGEND

- Foundation Borehole
- Monitoring Well
- Pavement Borehole
- Test Pit

BH No	ELEV. (m)	COORDINATES (UTM, NAD83, ZONE17)	
		NORTHING (m)	EASTING (m)
BH80	316.6	4 858 879.9	590 214.5
BH80A	316.6	4 858 891.5	590 214.2



SCALE

NOTE
This drawing is for subsurface information only. Surface details and features are for conceptual illustration. The subsurface conditions can be expected to vary between and beyond the borehole locations.

REFERENCE
Drawing provided in digital format by IBI Group received Oct. 10, 2019 and June 19, 2019.

DATE	BY	DESCRIPTION

DESIGN	RA	PROJECT No.	DATE
DRAWN	KC	CHK RA	1-17-0714

GEORES No.:	FIGURE No.
-	16



References:

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Key Map



Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Notes:



Legend:

- Approximate Site Boundary
- Approximate Study Area; 500m
- Collector
- Local / Street
- Commercial
- Dewatering
- Domestic
- Industrial
- Livestock
- Monitoring and Test Hole
- Municipal
- Not Used
- Public

Project Title:

Hydrogeological Assessment

Site Location:

Airport Road,
Caledon, Ontario

Figure Title:

MECP Well Records Map

Designed By:

MA

File No.:

1-17-0714-46

Drawn By:

SSK

Scale:

As Shown

Reviewed By:

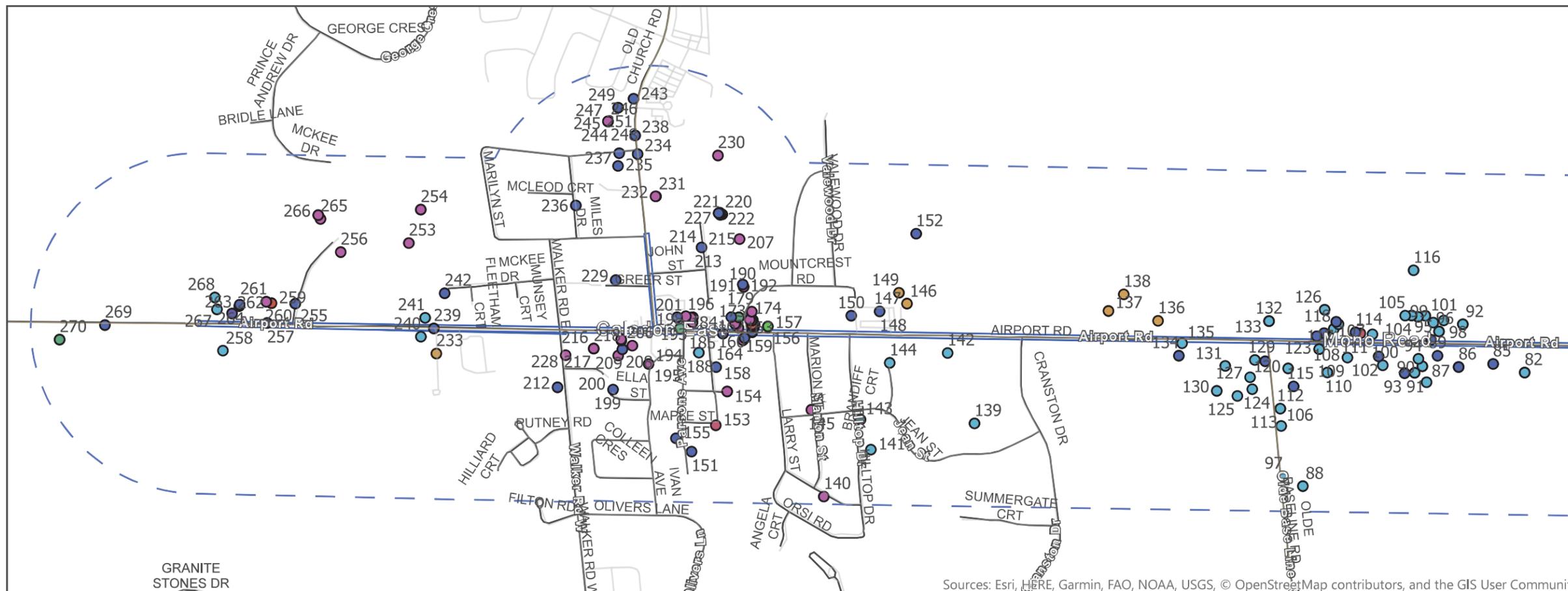
PR

Figure No.:

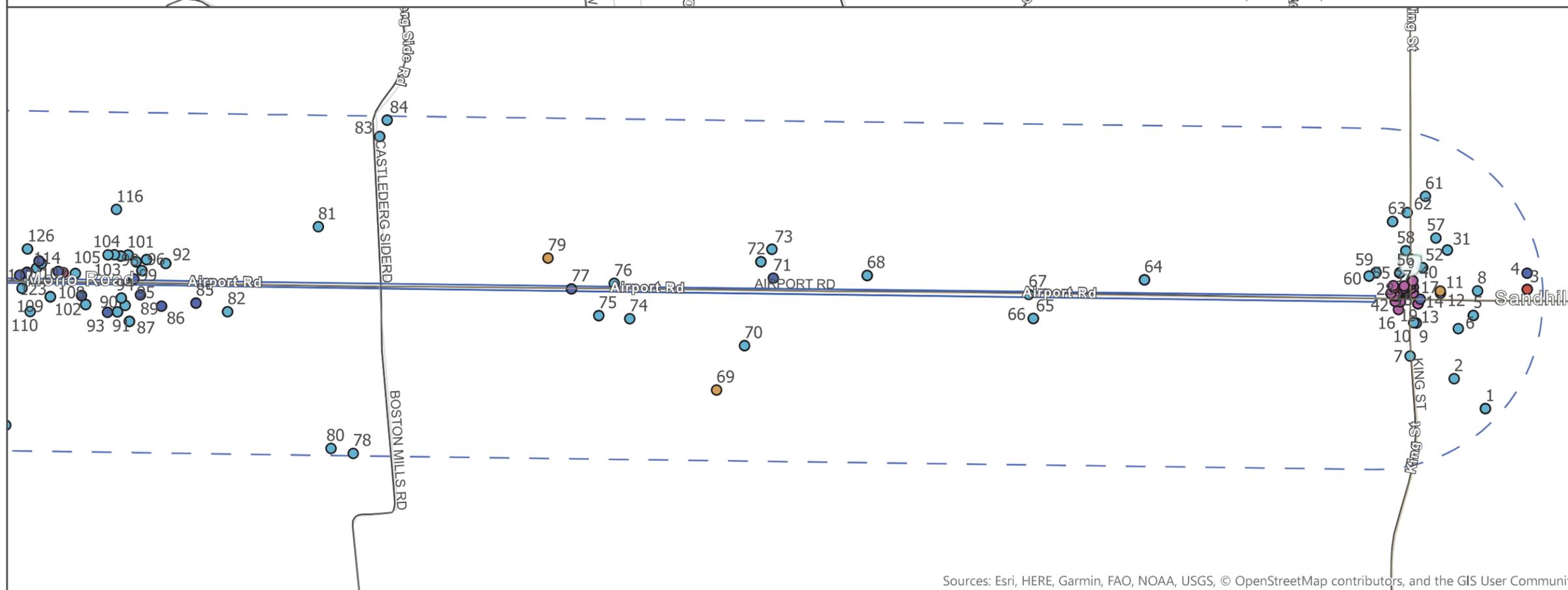
9

Date:

December 2020

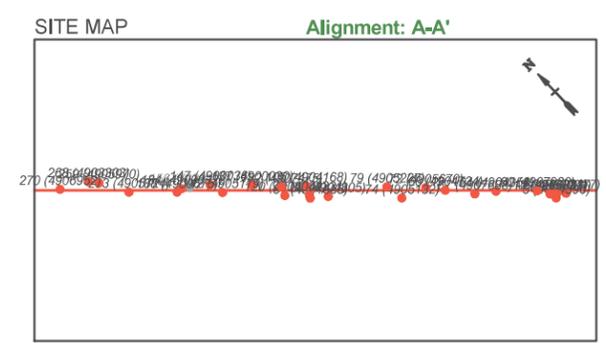
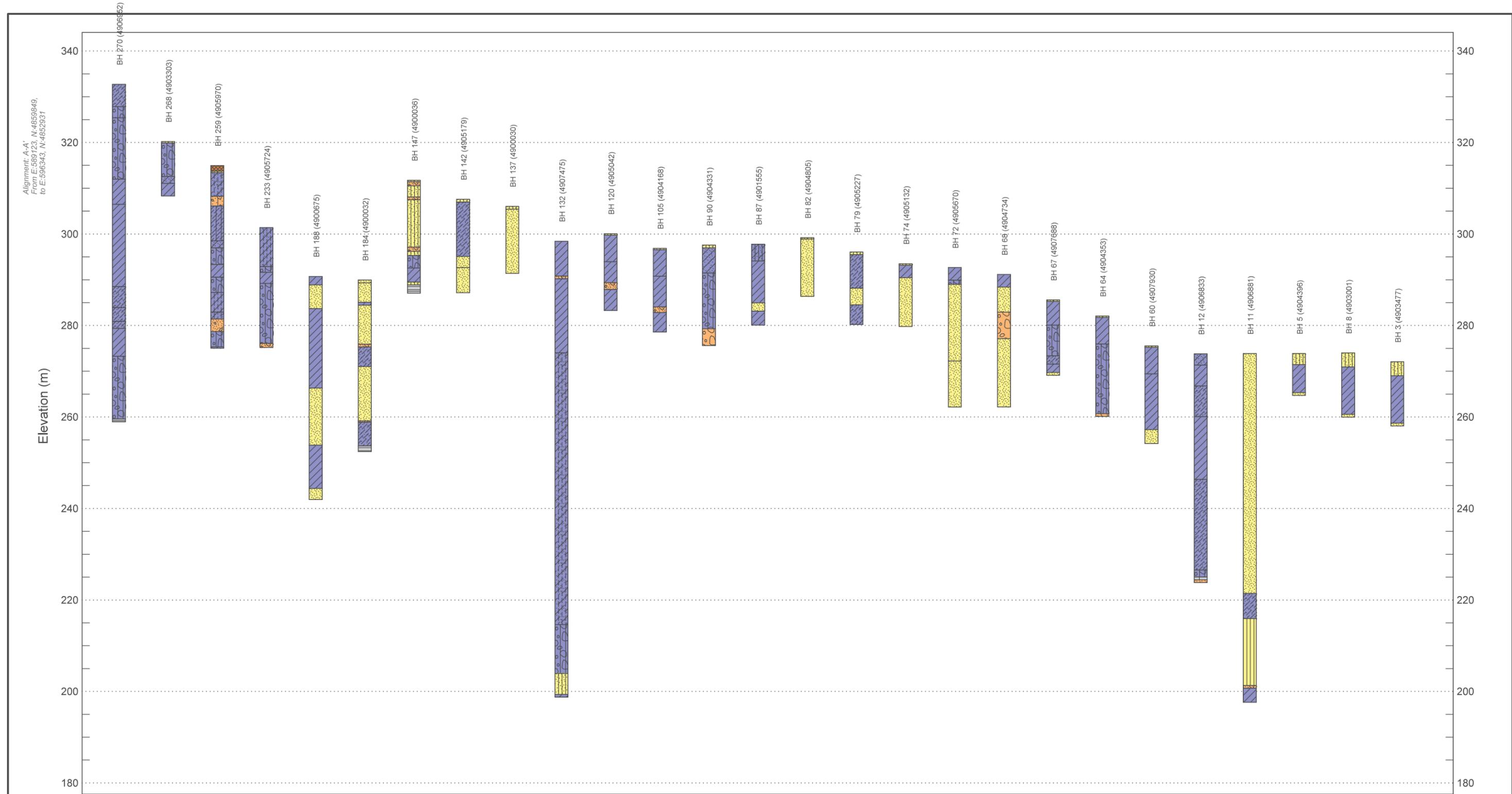


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Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Report: ISECTION - TABLOID - ELEV



LITHOLOGY GRAPHIC LEGEND

Silt and Sand	Silt	Limestone	Gravelly Sand and Silt	Bedrock (cored)
Clay	Sand and Gravel	Gravelly Sand	Clayey Silty Sand	Sandy Silty Clay
Sand	Sandy Clay	Gravel	Sandy Silt	Fill
Clayey Sand	Clay and Gravel	Sandy Clayey Silt	Sand and Silt	Gravel and Silty Sand

Boreholes Equally Spaced

INTERPRETIVE LEGEND

- WL on completion of drilling
- Stabilized WL, most recent

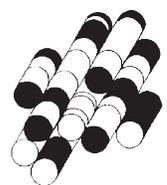
- FILL
- GRAVELS (gravel to gravelly sand)
- SILT TO SAND (not till)
- COHESIONLESS TILLS
- COHESIVE SOILS (clayey silt to clay, incl. tills)
- DISTURBED/REWORKED SOILS

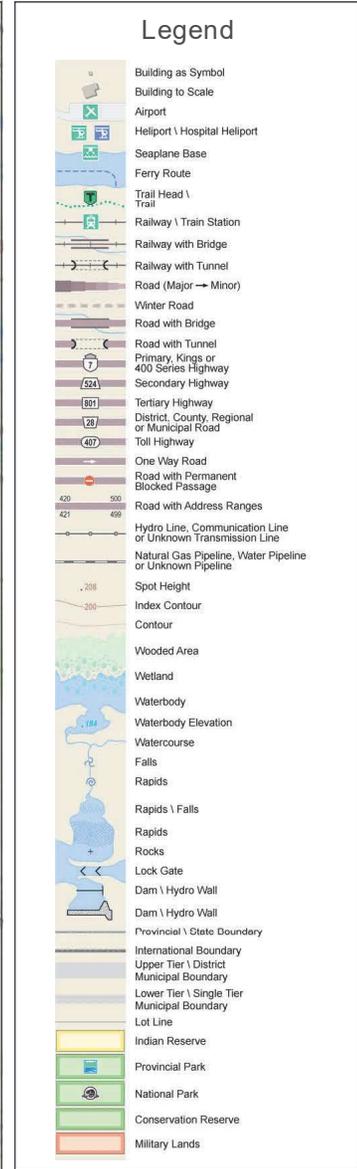
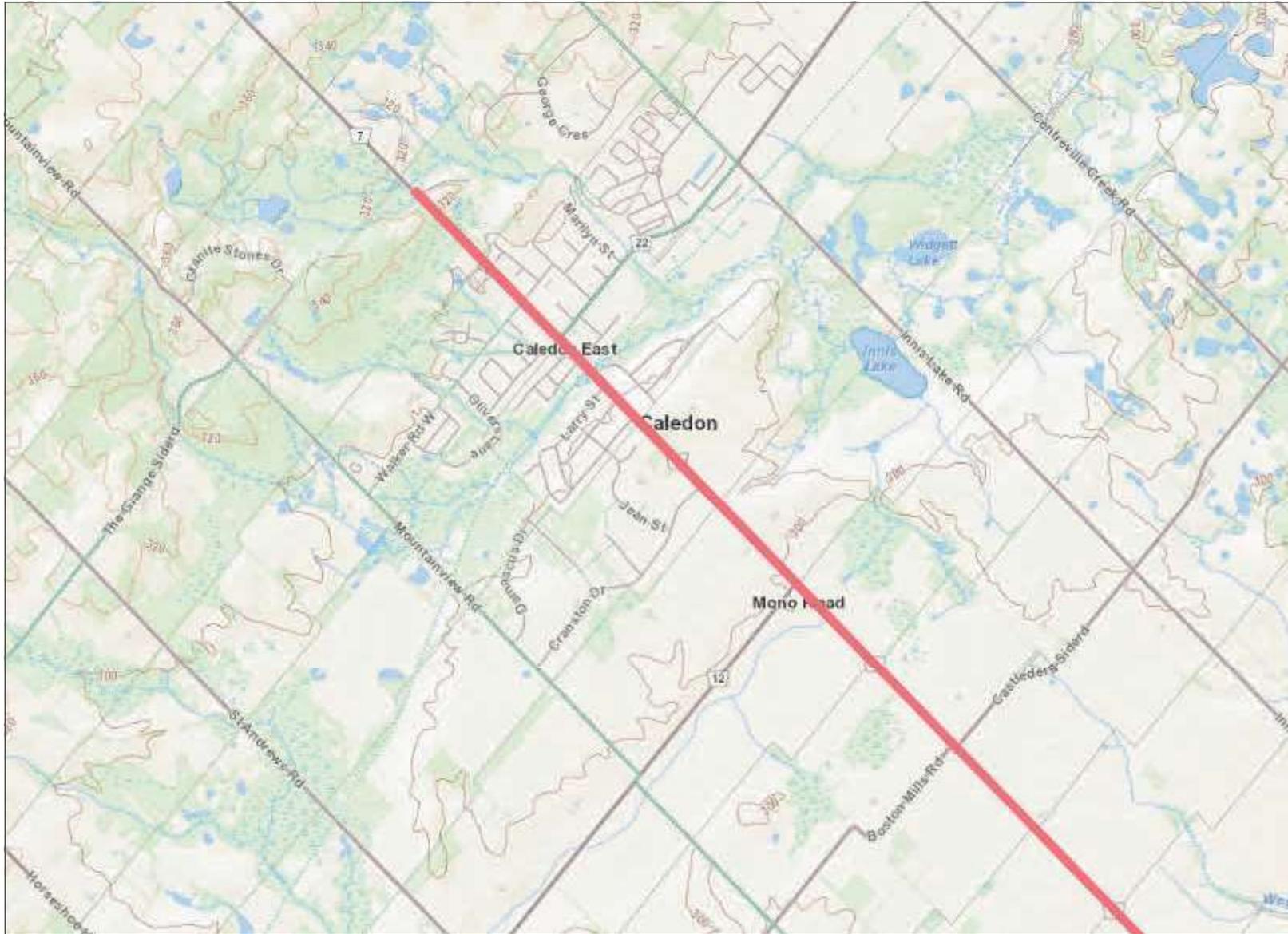
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:	SUBSURFACE PROFILE MECP CROSS SECTION	FIGURE:	10
File No.:	1-17-0714		

APPENDIX A

TERRAPROBE INC.





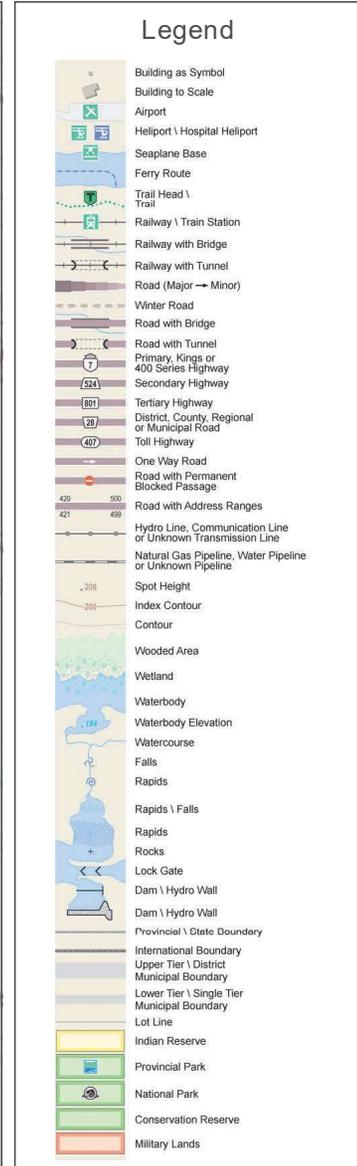
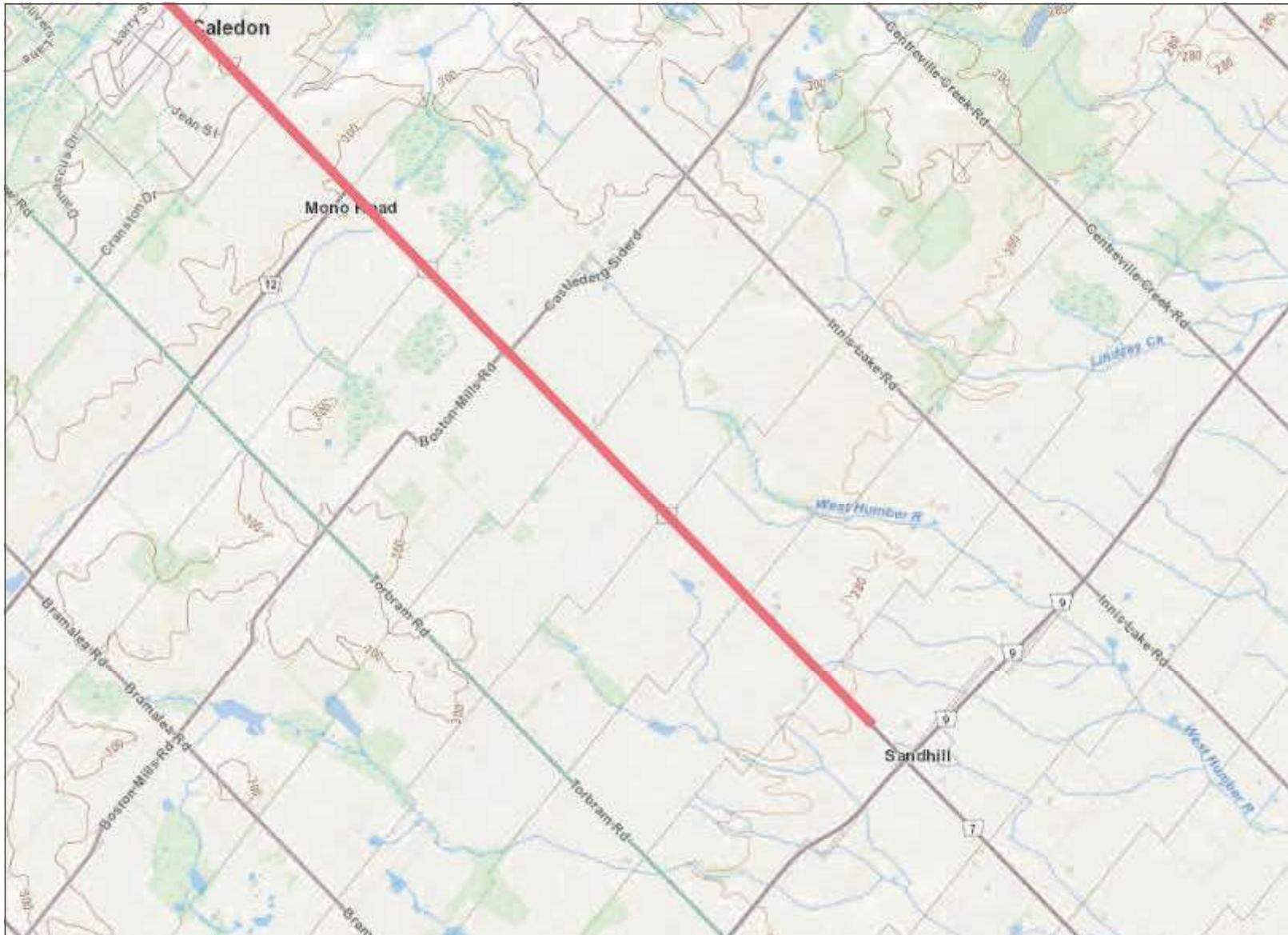
Projection: Web Mercator 

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Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion
- Wetland**
 - Provincially Significant Wetland Evaluated
 - Non - Provincially Significant Wetland Evaluated
 - Unevaluated Wetland
- Area of Natural Heritage & Scientific Interest (ANSI)**
 - Provincially Significant Life Science ANSI
 - Provincially Significant Earth Science ANSI
- Greenbelt Plan**
 - Boundary
 - Greenbelt External Connections
- Land Use Designations**
 - Protected Countryside
 - Greenbelt Towns and Villages
 - Greenbelt Hamlets
 - Urban River Valley
 - Greenbelt Specialty Crop Area
- Niagara Escarpment Plan (NEP)**
 - Boundary
 - Parks and Open Space System
 - Land Use Designations**
 - Escarpment Natural Area
 - Escarpment Protection Area
 - Escarpment Rural Area
 - Mineral Resource Extraction Area
 - Escarpment Recreation Area
 - Urban Area
 - Minor Urban Centre
- Oak Ridges Moraine Conservation Plan (ORM)**
 - Boundary
 - Land Use Designations**
 - Natural Core Area
 - Natural Linkage Area
 - Countryside Area
 - Rural Settlement
 - Palgrave Estates Residential Community
 - Settlement Area



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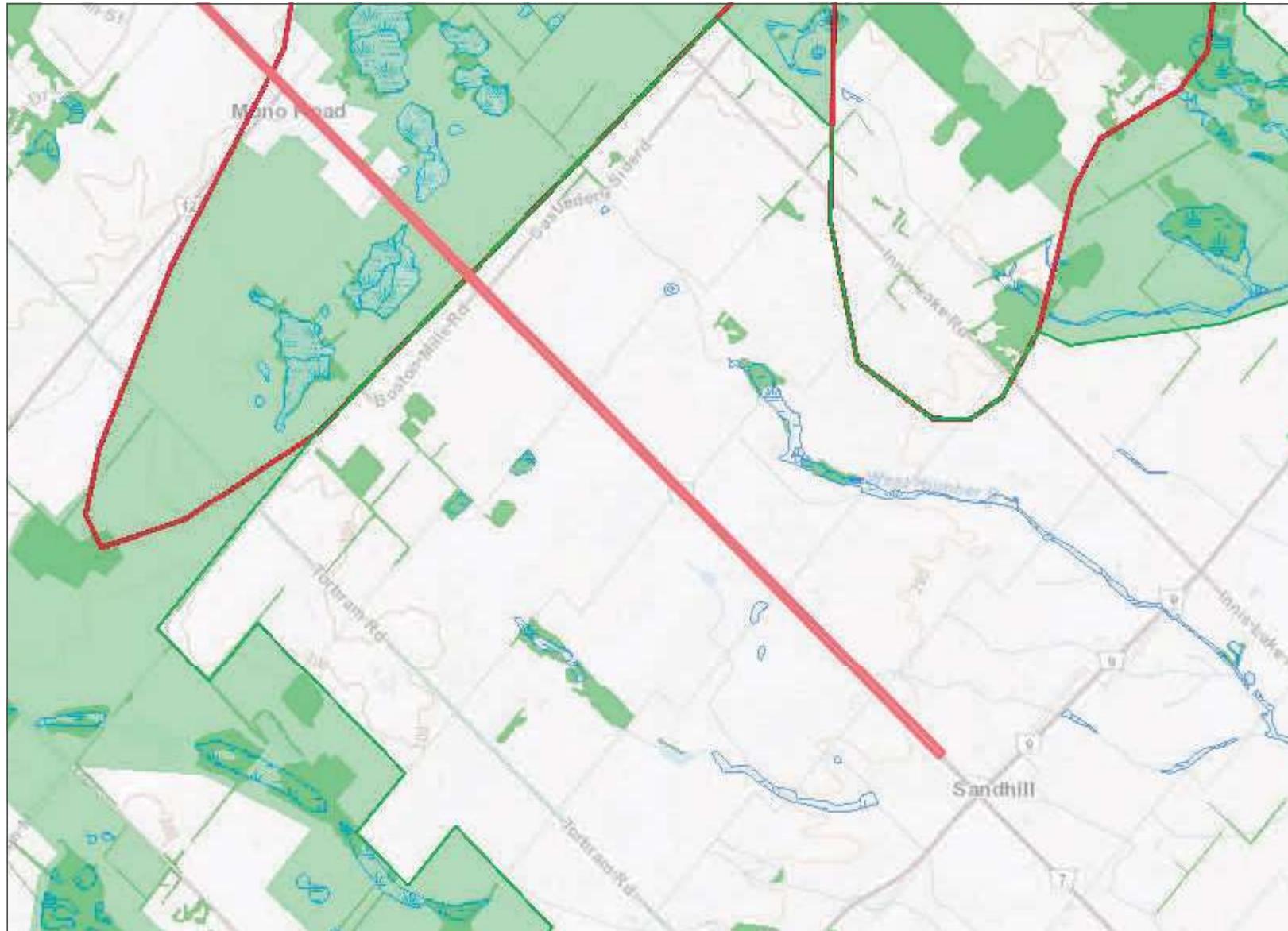
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Legend

-  Assessment Parcel
-  Woodland
-  Conservation Reserve
-  Provincial Park
-  Natural Heritage System
-  Ecoregion
- Wetland**
 -  Provincially Significant Wetland Evaluated
 -  Non - Provincially Significant Wetland Evaluated
 -  Unevaluated Wetland
- Area of Natural Heritage & Scientific Interest (ANSI)**
 -  Provincially Significant Life Science ANSI
 -  Provincially Significant Earth Science ANSI
- Greenbelt Plan**
 -  Boundary
 -  Greenbelt External Connections
- Land Use Designations**
 -  Protected Countryside
 -  Greenbelt Towns and Villages
 -  Greenbelt Hamlets
 -  Urban River Valley
 -  Greenbelt Specialty Crop Area
- Niagara Escarpment Plan (NEP)**
 -  Boundary
 -  Parks and Open Space System
- Land Use Designations**
 -  Escarpment Natural Area
 -  Escarpment Protection Area
 -  Escarpment Rural Area
 -  Mineral Resource Extraction Area
 -  Escarpment Recreation Area
 -  Urban Area
 -  Minor Urban Centre
- Oak Ridges Moraine Conservation Plan (ORM)**
 -  Boundary
- Land Use Designations**
 -  Natural Core Area
 -  Natural Linkage Area
 -  Countryside Area
 -  Rural Settlement
 -  Palgrave Estates Residential Community
 -  Settlement Area

1.3 0 0.66 1.3 Kilometers

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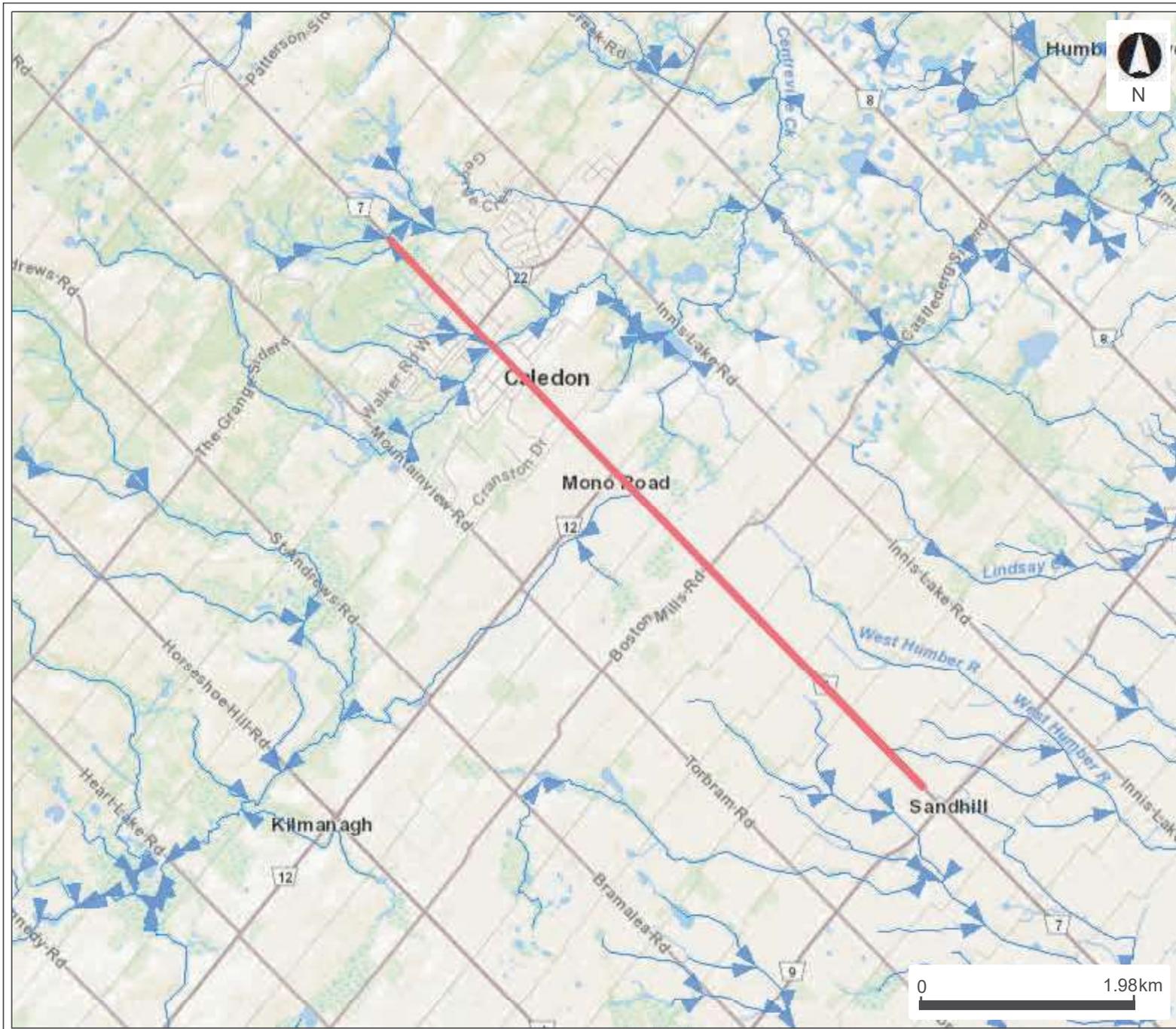


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Watercourse Flow Direction

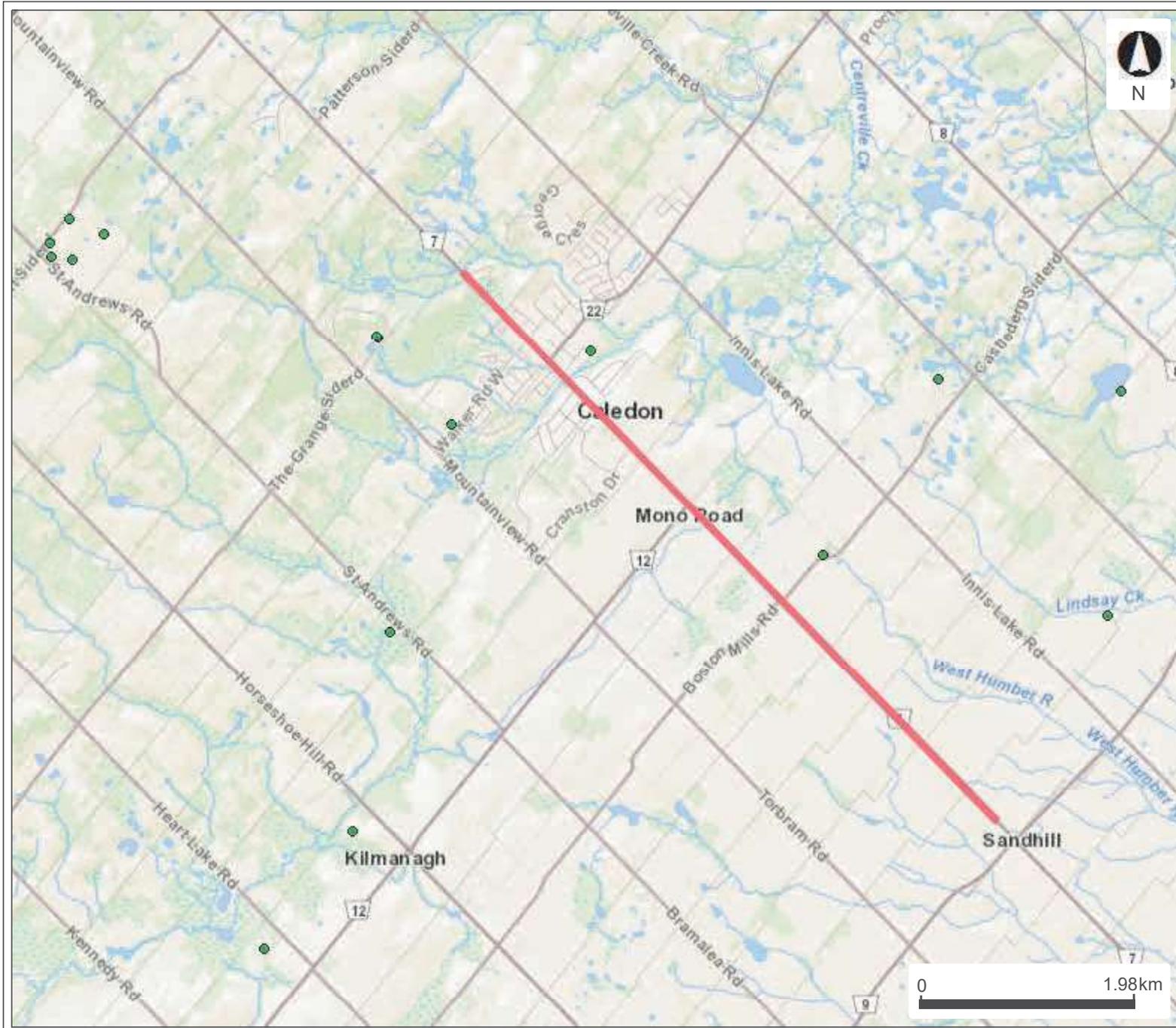


Legend

▶ Watercourse Direction

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Active Permits to Take Water



Legend

- Permits To Take Water: Active

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That address appears to be within a TRCA Regulated Area.

[CLICK HERE FOR INFORMATION ON NEXT STEPS](#)

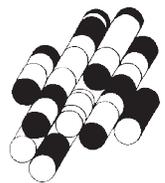


Map Layers

-  TRCA Conceptual Regulated Area
-  Parcel Boundary

APPENDIX B

TERRAPROBE INC.



OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
1	4904626	10319407	595317.5	4853354	272.61621	Water Supply	Domestic		1974-12-30 0:00:00	13.725	1.525					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0015 GREY CLAY 0045 GREY SAND 0049
2	4904763	10319535	595312.5	4853483	272.583862	Water Supply	Domestic		1975-09-25 0:00:00	14.03	1.525					Boring		Boring	BLCK LOAM 0002 BRWN CLAY 0015 BLUE CLAY STNS 0045 GREY SAND 0050
3	4903477	10318311	595654.6	4853523	272.059051	Water Supply	Public		1970-06-16 0:00:00	14.335	1.83					Boring		Boring	BRWN LOAM 0008 GREY CLAY 0046 GREY MSND 0047
4	7271763	1006248900	595688	4853558	272.071929	Abandoned-Other			2016-08-25 0:00:00	2.400000095									
5	4904396	10319181	595484.6	4853579	273.876708	Water Supply	Domestic		1974-05-21 0:00:00	9.15	2.44					Boring		Boring	BRWN LOAM 0008 GREY CLAY 0028 CSND 0030
6	4907601	10322160	595425	4853582	274.132873	Water Supply	Domestic		1991-12-10 0:00:00	17.995	3.05					Boring		Boring	BRWN LOAM HARD 0001 BRWN SAND CLAY HARD 0059 GREY CLAY SAND LOOS 0060
7	4905759	10320452	595264.6	4853623	273.964141	Water Supply	Domestic		1980-08-28 0:00:00	13.725	1.525					Boring		Boring	BRWN LOAM 0002 BRWN CLAY 0018 BLUE CLAY 0044 GREY SAND 0045 BLUE CLAY 0046
8	4903001	10317842	595544.6	4853623	273.999603	Water Supply	Domestic		1968-11-21 0:00:00	14.03						Boring		Boring	BRWN LOAM 0010 GREY CLAY 0044 MSND 0046
9	4906922	10321483	595346	4853681	273.96286	Water Supply	Domestic		1988-10-05 0:00:00	5.795	5.795					Boring		Boring	BLCK LOAM 0002 BRWN CLAY STNS 0019 BRWN SAND STNS 0023 BLUE CLAY STNS 0041
10	4906492	10321057	595341.6	4853687	273.990692	Water Supply	Domestic		1986-06-06 0:00:00	8.235	0.915					Boring		Boring	BLCK LOAM 0003 BRWN CLAY SAND 0010 BLUE CLAY STNS 0027 GREY SAND 0029
11	4906881	10321442	595460	4853695	273.850036	Water Supply	Domestic		1988-08-13 0:00:00	72.895	0.61					Cable Tool		Cable Tool	GREY SAND LOOS 0172 GREY CLAY SAND LOOS 0190 GREY SILT LOOS 0238 GREY SAND GRVL LOOS 0240 GREY CLAY HARD 0250
12	4906833	10321394	595464	4853700	273.793884	Water Supply	Livestock		1988-05-07 0:00:00	49.41	1.22					Cable Tool		Cable Tool	BRWN CLAY SAND LOOS 0008 GREY CLAY LOOS 0023 GREY CLAY SAND PCKD 0045 GREY CLAY LOOS 0090 GREY CLAY SAND PCKD 0155 GREY CLAY GRVL LOOS 0160 GREY LMSN HARD 0162 GREY GRVL SAND PCKD 0164
13	7240320	1005327735	595390	4853719	274.615631	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-24 0:00:00			0.305	6.1	3.05	6.1	Direct Push		Direct Push	BRWN GRVL SAND 0008 BRWN SILT CLAY TILL 0012 GREY SILT CLAY TILL 0020
14	7240320	1005327735	595390	4853719	274.615631	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-24 0:00:00			0	0.305	3.05	6.1	Direct Push		Direct Push	
15	7163578	1003513628	595404	4853724	274.206756				2011-04-06 0:00:00										
16	7161918	1003496963	595336	4853747	274.964965	Test Hole	Test Hole		2011-03-09 0:00:00			0	9.15	6.1	9.15	Rotary (Convent.)		Rotary (Convent.)	BRWN FILL LOOS 0003 BRWN CLAY SAND HARD 0015 GREY CLAY SILT HARD 0030
17	7240323	1005327744	595402	4853752	274.709289	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-26 0:00:00			0	0.305	3.05	6.1	Direct Push		Direct Push	BRWN GRVL SAND 0007 BRWN SILT CLAY TILL 0012 GREY SILT CLAY TILL 0020
18	7240323	1005327744	595402	4853752	274.709289	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-26 0:00:00			0.305	6.1	3.05	6.1	Direct Push		Direct Push	
19	7240321	1005327738	595356	4853760	275.404449	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-24 0:00:00			2.135	6.1	3.05	6.1	Direct Push		Direct Push	BRWN GRVL SAND 0007 BRWN SILT TILL CLAY 0010 BRWN GRVL SAND 0012 GREY SILT TILL CLAY 0020
20	7240321	1005327738	595356	4853760	275.404449	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-24 0:00:00			0	0.305	3.05	6.1	Direct Push		Direct Push	
21	7240352	1005327831	595414	4853764	274.312774	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-23 0:00:00			0.305	6.1	3.05	6.1	Direct Push		Direct Push	BRWN GRVL SAND 0008 BRWN SILT CLAY TILL 0012 GREY SILT CLAY TILL 0020
22	7240352	1005327831	595414	4853764	274.312774	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-23 0:00:00			0	0.305	3.05	6.1	Direct Push		Direct Push	
23	7305600	1006985709	595389	4853766		Observation Wells	Test Hole	Monitoring	2018-01-19 0:00:00			0	6.1	3.05	6.1	Direct Push		Direct Push	BRWN SAND GRVL 0010 BRWN SILT SAND 0020
24	7305602	1006985721	595406	4853767		Observation Wells	Test Hole	Monitoring	2018-01-19 0:00:00			0	6.1	3.05	6.1	Direct Push		Direct Push	BRWN SILT SAND 0005 GREY SILT SAND 0020
25	7267414	1006165745	595382	4853768	275.3096	Abandoned-Other	Monitoring and Test Hole		2016-06-02 0:00:00										
26	7240322	1005327741	595346	4853771	275.114837	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-24 0:00:00			0	0.305	3.05	6.1	Rotary (Convent.)	DIRECT PUSH	Rotary (Convent.)	BRWN 0006 BRWN SILT CLAY TILL 0012 GREY SILT CLAY TILL 0026
27	7240322	1005327741	595346	4853771	275.114837	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-24 0:00:00			0.305	6.1	3.05	6.1	Rotary (Convent.)	DIRECT PUSH	Rotary (Convent.)	
28	7304956	1006982358	595375	4853773		Observation Wells	Test Hole	Monitoring	2018-01-11 0:00:00			0	13.725	10.675	13.725	Boring		Boring	
29	7267415	1006165756	595393	4853773	275.001556	Abandoned-Other	Monitoring and Test Hole		2016-06-07 0:00:00										
30	7304957	1006982361	595393	4853773		Observation Wells	Test Hole	Monitoring	2018-01-10 0:00:00			0	15.25	12.2	15.25	Boring		Boring	
31	4904946	10319712	595564.6	4853773	272.930297	Water Supply	Domestic		1976-09-03 0:00:00	14.64	2.135					Boring		Boring	BLCK LOAM 0002 BRWN CLAY 0015 BLUE CLAY STNS 0048 GREY FSND 0050
32	7305598	1006985700	595381	4853775		Observation Wells	Test Hole	Monitoring	2018-01-18 0:00:00			0	7.625	4.575	7.625	Direct Push		Direct Push	BRWN SAND GRVL 0010 BRWN SILT SAND 0025
33	7305601	1006985718	595414	4853775		Observation Wells	Test Hole	Monitoring	2018-01-19 0:00:00			0	6.1	3.05	6.1	Direct Push		Direct Push	BRWN SILT SAND 0005 GREY SILT SAND 0020

OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
34	7236450	1005294656	595369	4853776	275.093261		Monitoring and Test Hole		2014-12-11 0:00:00			0	7.625	4.575	7.625	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND GRVL FILL 0005 BRWN CLAY 0012 GREY CLAY 0025
35	7305597	1006985694	595364	4853778		Observation Wells	Test Hole	Monitoring	2018-01-18 0:00:00					3.05	6.1	Direct Push		Direct Push	BRWN SAND GRVL 0010 GREY SILT SAND 0020
36	7305597	1006985694	595364	4853778		Observation Wells	Test Hole	Monitoring	2018-01-18 0:00:00			0	6.1	3.05	6.1	Direct Push		Direct Push	
37	7236447	1005294647	595390	4853778	274.880065	Monitoring and Test Hole	Monitoring and Test Hole		2014-12-12 0:00:00			0	6.1	3.05	6.1	Rotary (Convent.)		Rotary (Convent.)	BLCK ---- SOFT 0000 BRWN FILL FSND SOFT 0010 GREY CLAY SILT SOFT 0020
38	7304958	1006982364	595402	4853779		Observation Wells	Test Hole	Monitoring	2018-01-09 0:00:00			0	15.25	12.2	15.25	Boring		Boring	
39	7240353	1005327834	595426	4853779	274.160278	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-23 0:00:00			0.305	6.1	3.05	6.1	Direct Push		Direct Push	BRWN GRVL SAND 0003 BRWN SILT SAND TILL 0012 GREY SILT SAND TILL 0020
40	7240353	1005327834	595426	4853779	274.160278	Monitoring and Test Hole	Monitoring and Test Hole		2015-03-23 0:00:00			0	0.305	3.05	6.1	Direct Push		Direct Push	
41	7236452	1005294662	595367	4853781	274.953216	Abandoned-Other	Monitoring and Test Hole		2014-12-11 0:00:00										
42	7304959	1006982367	595358	4853782		Observation Wells	Test Hole	Monitoring	2018-01-31 0:00:00			0	6.1	3.05	6.1	Boring		Boring	
43	7267413	1006165734	595362	4853782	274.92691	Abandoned-Other	Monitoring and Test Hole		2016-06-02 0:00:00										
44	7304955	1006982355	595365	4853782		Observation Wells	Test Hole	Monitoring	2018-01-15 0:00:00			0	13.725	10.675	13.725	Boring		Boring	
45	7305599	1006985706	595385	4853782		Observation Wells	Test Hole	Monitoring	2018-01-19 0:00:00			0	6.1	3.05	6.1	Direct Push		Direct Push	BRWN SAND GRVL 0009 BRWN SILT CLAY 0020
46	7236446	1005294644	595392	4853782	274.675109	Monitoring and Test Hole	Monitoring and Test Hole		2014-12-11 0:00:00			0	6.1	3.05	6.1	Rotary (Convent.)		Rotary (Convent.)	BLCK ---- SOFT 0000 BRWN CSND SILT SOFT 0010 GREY CLAY SILT SOFT 0020
47	7236449	1005294653	595365	4853785	274.818298		Monitoring and Test Hole		2014-12-11 0:00:00			0	6.1	3.05	6.1	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND GRVL FILL 0004 BRWN CLAY DNSE 0012 GREY CLAY 0020
48	7236448	1005294650	595397	4853786	274.43518	Test Hole	Monitoring and Test Hole		2014-12-12 0:00:00			0	6	3	6	Rotary (Convent.)		Rotary (Convent.)	BLCK ---- SOFT 0000 BRWN SAND GRVL SILT 0011 GREY SILT CLAY FSND 0020
49	7267411	1006165706	595355	4853787	274.789367	Abandoned-Other	Monitoring and Test Hole		2016-06-07 0:00:00										
50	7267412	1006165731	595355	4853787	274.789367	Abandoned-Other	Monitoring and Test Hole		2016-06-02 0:00:00										
51	7305596	1006985688	595358	4853787		Observation Wells	Test Hole	Monitoring	2018-01-18 0:00:00			0	6.1	3.05	6.1	Direct Push		Direct Push	BRWN SAND GRVL 0005 BRWN CLAY SILT TILL 0015 GREY SILT SAND TILL 0025
52	4900017	10314865	595474.6	4853787	273.701171	Water Supply	Domestic		1961-10-17 0:00:00	9.15	0					Boring		Boring	BRWN LOAM 0012 GREY CLAY 0028 CSND 0030
53	7304954	1006982352	595353	4853797		Observation Wells	Test Hole	Monitoring	2018-01-11 0:00:00			0	3.05	1.525	3.05	Boring		Boring	
54	7318502	1007287590	595372	4853802		Abandoned-Other	Public			2.099999905									
55	7236451	1005294659	595374	4853809	274.134704	Monitoring and Test Hole	Monitoring and Test Hole		2014-12-11 0:00:00			0	6.1	3.05	6.1	Direct Push		Direct Push	BRWN FILL GRVL 0002 BRWN SILT SAND LOOS 0012 BRWN SILT SAND HARD 0020
56	4905178	10319933	595414.6	4853823	273.992523	Water Supply	Domestic		1977-06-27 0:00:00	11.59	2.135					Boring		Boring	BLCK LOAM 0002 BRWN CLAY 0014 BLUE CLAY 0038 BRWN SAND GRVL 0040
57	4903028	10317869	595564.6	4853823	273.885803	Water Supply	Domestic		1968-06-28 0:00:00	7.625						Boring		Boring	LOAM 0002 BRWN CLAY STNS 0023 CSND 0025
58	4900020	10314868	595473.6	4853858	274.129638	Water Supply	Domestic		1956-11-14 0:00:00	6.405	1.525					Cable Tool		Cable Tool	YLLW CLAY 0005 BLUE CLAY 0021 GRVL MSND 0036
59	4903020	10317861	595364.6	4853873	275.064666	Water Supply	Domestic		1968-07-23 0:00:00	8.235						Boring		Boring	BRWN CLAY 0005 BLUE CLAY STNS 0027 CLAY MSND 0033
60	4907930	10322489	595342	4853880	275.535034	Water Supply	Domestic		1994-11-24 0:00:00	18.3	3.05					Boring		Boring	BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0060 GREY SAND LOOS 0070
61	4900015	10314863	595628.6	4853934	273.651977	Water Supply	Domestic		1958-04-22 0:00:00	76.25						Cable Tool		Cable Tool	YLLW CLAY 0012 BLUE CLAY 0061 MSND CLAY 0084 HPAN 0200 FSND 0211 HPAN 0248 GRVL 0251
62	4906484	10321049	595555.6	4853937	273.991241	Water Supply	Domestic		1985-09-12 0:00:00	55.51						Cable Tool		Cable Tool	BRWN CLAY 0009 BLUE CLAY STNS 0045 BLUE CLAY 0160 BLUE CLAY SILT 0174 BLUE SAND SILT GRVL 0182 GRVL DRTY 0187
63	4906486	10321051	595505.6	4853948	273.737701	Water Supply	Domestic	Public	1985-08-24 0:00:00	55.51				55.51	56.73	Cable Tool		Cable Tool	BRWN CLAY 0010 BLUE CLAY STNS 0048 BLUE CLAY 0160 BLUE CLAY SILT 0175 BLUE CLAY SAND SILT 0182 GRVL 0186
64	4904353	10319138	594851.5	4854338	282.06961	Water Supply	Domestic		1974-03-08 0:00:00	21.35	3.05					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0020 GREY CLAY BLDR 0070 GREY GRVL 0072
65	4906344	10320910	594532.5	4854486	285.221191	Water Supply	Domestic		1985-06-20 0:00:00	14.64	1.83					Boring		Boring	BLCK LOAM 0002 BRWN CLAY SAND 0023 BLUE CLAY STNS 0047 GREY CLAY SAND STNS 0048
66	4906344	10320910	594532.5	4854486	285.221191	Water Supply	Domestic		1985-06-20 0:00:00	7.015	1.83					Boring		Boring	
67	4907688	10322247	594572.5	4854547	285.568664	Water Supply	Domestic		1992-06-16 0:00:00	16.47	2.135					Boring		Boring	BRWN LOAM 0001 BRWN CLAY HARD 0018 BLUE CLAY STNS 0040 BLUE CLAY SAND SOFT 0046 BLUE CLAY HARD 0052 GREY CSND 0054

OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
68	4904734	10319508	594264.5	4854923	291.159515	Water Supply	Domestic		1975-07-05 0:00:00	14.64	9.15			26.23	27.145	Rotary (Convent.)		Rotary (Convent.)	BRWN CLAY 0009 BRWN FSND 0027 BLUE GRVL 0046 BLUE MSND 0095
69	4901553	10316398	593703.5	4854990	294.474945	Water Supply	Livestock	Domestic	1963-07-15 0:00:00	10.37	6.71					Boring		Boring	LOAM 0002 FSND 0022 CSND 0038
70	4907352	10321911	593855.5	4855027	292.957275	Water Supply	Domestic		1990-03-20 0:00:00	6.1	6.1					Boring		Boring	LOAM SAND 0040
71	7314550	1007158794	594057	4855112					2018-06-08 0:00:00										
72	4905670	10320374	594064.5	4855173	292.656463	Water Supply	Domestic		1980-06-25 0:00:00	27.45	7.625			28.67	30.5	Rotary (Convent.)		Rotary (Convent.)	BRWN CLAY 0009 BRWN CLAY GRVL 0012 BRWN FSND 0067 GREY FSND 0100
73	4408153	11176479	594114	4855177	292.082458	Water Supply	Domestic		2004-06-10 0:00:00	9.229999542	6.76999998	0	6	9.850000381	12.31000042	Cable Tool		Cable Tool	BLCK LOAM 0002 BRWN SAND 0010 BRWN CLAY SILT 0028 BRWN FSND 0040
74	4905132	10319888	593664.5	4855323	293.503723	Water Supply	Domestic		1977-05-16 0:00:00	9.15	9.15					Boring		Boring	BRWN LOAM HARD 0001 BRWN CLAY HARD 0010 BRWN SAND LOOS 0045
75	4906664	10321228	593604.5	4855394	294.16867	Water Supply	Domestic		1987-02-24 0:00:00	6.1	5.49					Boring		Boring	BRWN LOAM HARD 0001 BRWN SAND PCKD 0036
76	4904481	10319264	593704.5	4855431	294.375335	Water Supply	Domestic		1974-07-15 0:00:00	8.235	8.235					Boring		Boring	BLCK LOAM 0002 GREY CLAY STNS 0014 BRWN CLAY STNS 0027 BRWN SAND 0042
77	7336363	1007492699	593601	4855508					2019-05-16 0:00:00										
78	7234746	1005282249	592791	4855608	297.415039	Water Supply	Domestic		2014-07-23 0:00:00		10.166565			27.755	29.28	Cable Tool		Cable Tool	BRWN SAND SILT CLAY 0098
79	4905227	10319982	593614.5	4855623	296.087402	Water Supply	Livestock		1977-11-04 0:00:00	10.065	10.37					Boring		Boring	BLCK LOAM 0002 BRWN CLAY SAND 0026 BRWN SAND 0038 BRWN CLAY SAND 0052
80	4906297	10320863	592753.5	4855665	296.935974	Water Supply	Domestic		1984-07-05 0:00:00	11.285	11.285					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0008 BRWN CLAY SAND 0022 BRWN FSND 0036 BRWN SAND CGRD 0037 BRWN CSND 0045 BRWN SAND CGRD 0046 BRWN FSND 0056
81	4906642	10321206	593185.5	4856167	299.047515	Water Supply	Domestic	Livestock	1987-03-30 0:00:00	97.295	22.875					Cable Tool		Cable Tool	PRDG 0057 BRWN SAND DRTY 0081 BLUE CLAY 0160 BLUE CLAY SILT LYRD 0306 BLUE GRVL CLAY SILT 0319 CSND 0323
82	4904805	10319577	592814.5	4856173	299.186462	Water Supply	Domestic		1975-12-03 0:00:00	7.32	7.32					Boring		Boring	BRWN LOAM HARD 0001 BRWN SAND SOFT 0042
83	4903728	10318561	593504.5	4856233	296.207733	Water Supply	Domestic		1971-09-08 0:00:00	24.095	12.505			24.095	25.315	Cable Tool		Cable Tool	LOAM 0001 BRWN CLAY 0020 BRWN FSND 0079 BRWN MSND 0083
84	4903730	10318563	593554.5	4856253	295.658081	Water Supply	Domestic		1971-08-31 0:00:00	23.79	12.81			23.79	25.01	Cable Tool		Cable Tool	LOAM 0001 YLLW CLAY STNS 0022 BRWN FSND 0078 BRWN MSND 0082
85	4901554	10316399	592764.5	4856257	299.367889	Abandoned-Supply			1964-08-17 0:00:00							Cable Tool		Cable Tool	PRDG 0040 BLUE CLAY 0064 QSND 0084
86	7190850	1004193052	592684	4856322	299.150177	Abandoned-Other			2012-10-24 0:00:00	11									
87	4901555	10316400	592583.5	4856356	297.764038	Water Supply	Domestic		1965-01-28 0:00:00	12.81	12.81					Boring		Boring	BRWN LOAM CLAY 0012 GREY CLAY 0042 GREY MSND 0048 GREY CLAY 0058
88	4904794	10319566	592102.5	4856390	295.143951	Water Supply	Domestic		1975-09-23 0:00:00	24.4	22.875			43.615	45.445	Rotary (Convent.)		Rotary (Convent.)	BRWN CLAY 0014 BLUE CLAY 0042 BLUE FSND CLAY STNS 0149
89	4908938	10526871	592662	4856390	298.253295	Abandoned-Other			2001-05-08 0:00:00							Not Known		Not Known	
90	4904331	10319119	592607.5	4856399	297.576446	Water Supply	Domestic		1974-01-03 0:00:00	21.96	12.2			20.74	21.96	Cable Tool		Cable Tool	LOAM 0002 BRWN SAND CLAY 0020 BLUE CLAY STNS 0060 GRVL 0072
91	4905012	10319777	592577.5	4856401	297.220672	Water Supply	Domestic		1976-01-25 0:00:00	24.705	15.25			24.095	25.01	Cable Tool		Cable Tool	LOAM 0002 BLUE CLAY 0020 BLUE CLAY STNS 0025 BLUE CLAY 0040 BLUE CLAY STNS 0045 BLUE CLAY 0075 SAND 0082
92	4904735	10319509	592781.5	4856405	298.799041	Water Supply	Domestic		1975-07-01 0:00:00	26.535	8.54			26.535	27.45	Rotary (Convent.)		Rotary (Convent.)	BRWN CLAY 0010 BRWN SAND 0095
93	7130274	1002724679	592555	4856421	296.783416	Abandoned-Other			2008-05-30 0:00:00				15.800000191						
94	4905452	10320185	592614.5	4856423	297.384246	Water Supply	Domestic		1978-10-06 0:00:00	15.25	7.625					Boring		Boring	BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0050 GREY SAND GRVL PCKD 0055
95	4908931	10526864	592681	4856438	297.887908	Abandoned-Other			2001-05-21 0:00:00							Not Known		Not Known	
96	4904394	10319179	592715.5	4856439	298.179962	Water Supply	Domestic		1974-07-10 0:00:00	13.725	3.05					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0010 GREY CLAY 0045 GREY GRVL 0050 GREY CLAY 0053
97	4903600	10318434	592079.5	4856453	296.775299	Water Supply	Domestic		1971-02-18 0:00:00	9.15	3.05					Boring		Boring	BRWN LOAM 0001 GREY CLAY 0029 GREY GRVL 0032
98	4904163	10318951	592748.5	4856453	298.243133	Water Supply	Domestic		1973-09-03 0:00:00	18.91	12.2					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0010 GREY CLAY STNS 0062 GREY SAND 0065
99	4904736	10319510	592721.5	4856470	297.918121	Water Supply	Domestic		1975-06-05 0:00:00	26.23	8.235			26.23	27.145	Rotary (Convent.)		Rotary (Convent.)	BRWN CLAY 0010 BRWN FSND 0090
100	4903357	10318194	592524.5	4856483	296.045776	Water Supply	Domestic		1969-09-29 0:00:00	9.15	1.22					Boring		Boring	BRWN LOAM 0003 GREY CLAY 0030 GREY GRVL 0035
101	4904169	10318957	592718.5	4856501	297.55838	Water Supply	Domestic		1973-09-02 0:00:00	20.74	12.2					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0010 GREY CLAY STNS 0068 GREY SAND 0070
102	4909256	10546527	592534	4856511	296.011322	Abandoned-Other	Not Used		2003-09-05 0:00:00							Not Known		Not Known	
103	4906256	10320823	592700.5	4856514	297.288818	Water Supply	Domestic		1984-10-05 0:00:00	20.435	12.2					Cable Tool		Cable Tool	LOAM 0001 BRWN CLAY 0015 BLUE CLAY 0065 GRVL 0067
104	4904737	10319511	592689.5	4856530	297.062896	Water Supply	Domestic		1975-06-05 0:00:00	26.23	7.93			26.23	27.145	Rotary (Convent.)		Rotary (Convent.)	BRWN CLAY 0010 BRWN MSND 0108

OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
105	4904168	10318956	592675.5	4856543	296.859008	Water Supply	Domestic		1973-09-01 0:00:00	12.81	10.675					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0020 GREY CLAY 0042 GREY SAND GRVL 0046 GREY CLAY 0060
106	4906926	10321487	592180.5	4856564	297.877838	Water Supply	Domestic		1988-08-29 0:00:00	15.25	6.1					Boring		Boring	BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0050 GREY SAND LOOS 0061
107	4900026	10314874	592566.5	4856571	296.087951	Water Supply	Domestic		1962-09-03 0:00:00	10.675	10.675					Boring		Boring	BRWN LOAM CLAY 0012 GREY CLAY 0035 GREY MSND 0037 GREY CLAY STNS 0050
108	4903483	10318317	592464.5	4856573	296.131805	Water Supply	Domestic		1970-08-04 0:00:00	12.2	7.625					Boring		Boring	BLCK LOAM 0002 BRWN CLAY STNS 0016 GREY GRVL STNS 0018 BRWN CLAY STNS 0040 GREY CLAY MSND 0045
109	4903483	10318317	592464.5	4856573	296.131805	Water Supply	Domestic		1970-08-04 0:00:00	4.88	7.625					Boring		Boring	
110	4904622	10319403	592390.5	4856583	296.967468	Water Supply	Domestic		1975-01-20 0:00:00	18.3	6.1					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0010 GREY CLAY 0060 GREY GRVL SAND 0067
111	4907514	10322073	592542.5	4856598	296.193328	Water Supply	Commerical	Public	1991-04-17 0:00:00	30.5	10.675					Rotary (Convent.)		Rotary (Convent.)	FGVL 0003 BRWN CLAY SILT SAND 0020 GREY SILT CLAY SAND 0080 BRWN SAND SILT 0100
112	4903545	10318379	592214.5	4856603	298.66217	Water Supply	Domestic		1970-12-08 0:00:00	15.555	10.675					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0012 GREY CLAY 0050 BRWN MSND 0052
113	4903350	10318187	592214.5	4856603	298.66217	Water Supply	Domestic		1969-10-02 0:00:00	14.03	10.065					Boring		Boring	BRWN CLAY MSND 0010 GREY CLAY 0033 GRVL 0035 GREY CLAY 0045 GREY MSND 0046
114	7333660	1007497617	592534	4856611					2019-05-07 0:00:00										
115	7177344	1003702625	592289	4856623	299.809722	Abandoned-Other	Other		2011-12-28 0:00:00		4.80000019								
116	4900027	10314875	592787.5	4856623	296.937774	Water Supply	Domestic		1967-05-24 0:00:00	18.3	9.15			18.605	19.825	Cable Tool		Cable Tool	BRWN CLAY MSND 0060 CSND GRVL 0065
117	4907027	10321588	592421	4856650	298.139892	Water Supply	Domestic		1989-02-10 0:00:00	13.725	11.59			12.81	13.725	Cable Tool		Cable Tool	LOAM 0001 BRWN CLAY SAND 0025 BLUE CLAY 0045 SAND 0048
118	4903550	10318384	592494.5	4856663	297.056549	Water Supply	Domestic		1970-12-16 0:00:00	12.81	5.49					Boring		Boring	LOAM 0001 BRWN CLAY 0014 BLUE CLAY 0030 BLUE CLAY MSND 0042 GREY FSND 0044
119	4903492	10318326	592514.5	4856663	296.847717	Water Supply	Domestic		1970-09-28 0:00:00	12.2	9.76					Boring		Boring	BLCK LOAM 0002 BRWN CLAY BLDR 0040 GREY GRVL MSND 0043 BRWN CLAY MSND STNS 0054
120	4905042	10319801	592314.5	4856673	300.050354	Water Supply	Domestic		1976-12-18 0:00:00	10.675	6.1					Boring		Boring	BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0035 GREY GRVL SAND LOOS 0040 GREY CLAY HARD 0055
121	4905762	10320455	592514.5	4856673	296.904937	Unfinished	Not Used		1980-11-01 0:00:00							Cable Tool		Cable Tool	PRDG 0030 BLUE CLAY 0050 BLUE CLAY GRVL 0090
122	7242252	1005388175	592465	4856674	297.514007	Abandoned-Other			2015-05-22 0:00:00	0.600000024									
123	7242232	1005388007	592443	4856683	297.931091	Abandoned-Other			2015-05-22 0:00:00	2.700000048									
124	4903383	10318219	592194.5	4856703	300.78424	Water Supply	Domestic		1969-11-05 0:00:00	11.895	0.61					Boring		Boring	BLCK LOAM 0004 BLCK LOAM 0025 GREY CLAY 0048
125	4904330	10319118	592148.5	4856719	301.669769	Water Supply	Domestic		1973-11-03 0:00:00	16.775	15.25					Cable Tool		Cable Tool	LOAM 0002 BLUE CLAY 0055 GRVL CLAY 0060
126	4905761	10320454	592514.5	4856723	297.076416	Water Supply	Domestic		1980-06-01 0:00:00	18.3	3.05			17.995	18.91	Cable Tool		Cable Tool	LOAM 0002 BLUE CLAY 0060 SAND GRVL 0065
127	4903141	10317981	592214.5	4856733	300.684143	Water Supply	Domestic		1968-06-28 0:00:00	6.1	6.1					Cable Tool		Cable Tool	LOAM 0005 CLAY MSND 0020 MSND CLAY 0037
128	7271772	1006248927	592280	4856736	300.038787														
129	4900668	10315516	592260.5	4856760	299.990814	Water Supply	Domestic		1959-11-01 0:00:00	14.03	10.37					Cable Tool		Cable Tool	LOAM 0001 YLLW CLAY 0018 BLUE CLAY 0046 GRVL 0047
130	4905141	10319897	592114.5	4856773	302.192413	Water Supply	Domestic		1977-06-14 0:00:00	10.98	10.675					Boring		Boring	BRWN LOAM 0001 BRWN CLAY 0025 BLUE CLAY STNS 0040 BRWN SAND 0048 BRWN GRVL 0052
131	4900669	10315517	592184.5	4856809	300.291137	Water Supply	Domestic		1962-12-08 0:00:00	10.37	10.37					Boring		Boring	BRWN LOAM 0020 GREY CLAY 0025 BRWN CSND 0046
132	4907475	10322034	592371.5	4856814	298.427215	Water Supply	Domestic		1990-11-17 0:00:00	96.075	21.35			96.075	99.125	Rotary (Convent.)		Rotary (Convent.)	BRWN CLAY 0025 BRWN SAND GVLY SLTY 0027 CLAY 0080 CLAY SNDY SILT 0275 CLAY ROCK 0310 SAND SILT 0325 GREY CLAY 0327
133	4907475	10322034	592371.5	4856814	298.427215	Water Supply	Domestic		1990-11-17 0:00:00	99.125	21.35			96.075	99.125	Rotary (Convent.)		Rotary (Convent.)	
134	7277993	1006321761	592106	4856927	304.012084	Abandoned-Other			2016-11-26 0:00:00	4.27									
135	4908542	10323077	592138.7	4856947	303.751464	Water Supply	Domestic		1999-11-29 0:00:00	5.49	7.625					Boring		Boring	BRWN LOAM 0001 BRWN CLAY STNS 0015 BLUE CLAY 0018 GREY SAND 0019 BLUE CLAY 0043
136	4900029	10314877	592133.5	4857045	304.7565	Water Supply	Livestock		1960-10-29 0:00:00	11.59	11.59					Boring		Boring	BRWN CLAY STNS 0020 BRWN CLAY MSND 0028 MSND 0044 CLAY MSND 0049 MSND 0050
137	4900030	10314878	592047.5	4857169	306.039001	Water Supply	Livestock	Domestic	1964-11-06 0:00:00	12.505	12.81					Cable Tool		Cable Tool	LOAM 0002 MSND 0048
138	4903051	10317892	592114.5	4857173	306.359191	Water Supply	Livestock	Domestic	1968-10-17 0:00:00	17.385	17.69					Boring		Boring	LOAM 0002 BRWN CLAY STNS 0021 STNS 0023 MSND 0027 FSND SILT 0057 CSND 0063 QSND 0070
139	4900670	10315518	591526.5	4857206	305.60202	Water Supply	Domestic		1955-11-09 0:00:00	14.945	14.945					Boring		Boring	BRWN MSND 0049 BRWN QSND 0057
140	7249503	1005717593	591051	4857362	297.845977	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
141	4900672	10315520	591249.5	4857365	305.386383	Water Supply	Domestic		1957-11-26 0:00:00	11.285	11.285					Boring		Boring	BRWN LOAM 0037 BRWN CSND 0055
142	4905179	10319934	591614.5	4857413	307.595825	Water Supply	Domestic		1977-06-29 0:00:00	14.945	14.945					Boring		Boring	BRWN LOAM 0002 BRWN CLAY SAND 0041 GREY SAND 0049 BRWN SAND 0067
143	4900671	10315519	591289.5	4857451	308.241241	Water Supply	Domestic		1956-12-11 0:00:00	16.47	16.47					Boring		Boring	BRWN LOAM 0018 BRWN LOAM MSND 0054 BRWN FSND 0063
144	4900673	10315521	591469.5	4857512	310.345031	Water Supply	Domestic		1959-10-06 0:00:00	16.47	16.47					Boring		Boring	BRWN LOAM 0040 BRWN MSND 0064

OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
145	7249502	1005717590	591204	4857574	303.636413	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
146	4900031	10314879	591629.5	4857603	311.523681	Water Supply	Livestock		1961-05-02 0:00:00	18.91	18.91					Boring		Boring	BRWN CLAY 0006 GRVL 0011 BRWN CLAY MSND 0029 BRWN MSND 0070 BRWN CLAY MSND 0073 BRWN MSND 0075
147	4900036	10314884	591554.5	4857643	311.755645	Test Hole	Not Used		1960-04-18 0:00:00	22.875						Cable Tool		Cable Tool	LOAM 0001 FSND BLDR 0004 FSND SILT 0012 FSND BLDR 0014 FSND SILT 0048 GRVL MSND 0051 MSND SILT GRVL 0054 CLAY GRVL 0063 CLAY 0073 MSND SILT 0075 SHLE 0081
148	4900036	10314884	591554.5	4857643	311.755645	Test Hole	Not Used		1960-04-18 0:00:00	1.22						Cable Tool		Cable Tool	
149	4903339	10318176	591634.5	4857643	311.55661	Water Supply	Livestock	Domestic	1969-11-01 0:00:00	54.29	22.875			54.595	59.17	Rotary (Convent.)		Rotary (Convent.)	CLAY 0010 MSND CLAY 0140 GREY CLAY 0178 MSND 0196
150	4900037	10314885	591484.5	4857693	309.190277	Test Hole	Not Used		1960-04-05 0:00:00	4.27						Cable Tool		Cable Tool	LOAM 0001 FSND BLDR 0014 GRVL 0018 FSND GRVL 0020 GRVL 0022 GRVL FSND CLAY 0025 FSND SILT 0034 FSND 0036 FSND SILT 0041
151	7190286	1004188391	590860	4857733	294.33377	Abandoned-Other			2012-10-12 0:00:00							Not Known		Not Known	
152	4910197	11555431	591794	4857734	310.267639	Abandoned-Other			2006-05-08 0:00:00		16.7000008								
153	4900674	10315522	590966.5	4857739	291.319152	Water Supply	Commerical		1949-08-13 0:00:00	15.25	11.895					Cable Tool		Cable Tool	LOAM MSND 0003 CLAY 0006 CLAY MSND 0030 BLUE CLAY 0043 GRVL CLAY MSND 0046 FSND 0055 FSND CLAY 0062 CLAY FSND 0069 HPAN CLAY 0096 MSND CLAY 0103 CLAY HPAN 0107 SHLE 0109
154	7249505	1005717613	591061	4857788	290.041687	Abandoned-Other	Monitoring		2015-09-25 0:00:00										
155	7191873	1004208330	590854	4857794	295.093994	Abandoned-Other			2012-11-09 0:00:00										
156	7323476	1007316792	591283	4857843		Dewatering	Dewatering		2018-11-11 0:00:00		1.44875	0	13.115	13.115	25.315	Rotary (Convent.)		Rotary (Convent.)	BRWN FILL SAND CLAY 0004 BRWN GRVL STNS CGVL 0013 GREY CLAY SILT SOFT 0043 GREY SAND GRVL CGVL 0056 BRWN SAND MSND 0078 BRWN SAND FSND 0118
157	7323476	1007316792	591283	4857843		Dewatering	Dewatering		2018-11-11 0:00:00		1.44875	13.115	25.315	13.115	25.315	Rotary (Convent.)		Rotary (Convent.)	
158	7186062	1004141211	591088	4857863	290.227386	Abandoned-Other			2012-08-21 0:00:00										
159	4907902	10322461	591237.5	4857863	290.284606	Observation Wells	Not Used		1994-08-19 0:00:00	12.2				12.2	13.725	Boring		Boring	BLCK LOAM 0001 GREY SILT CLAY SAND 0014 GREY SILT CLAY 0040 BRWN SAND GRVL LYRD 0050
160	4907960	10322519	591237.5	4857863	290.284606	Dewatering	Not Used		1994-08-31 0:00:00	12.505	2.135			12.505	18.605	Rotary (Convent.)		Rotary (Convent.)	GRVL FILL 0001 BLCK LOAM 0002 GREY CLAY SLTY SAND 0008 GREY SILT CLAY 0029 GREY CLAY SLTY SOFT 0038 GREY CLAY STNS HARD 0040 BRWN CLAY SAND 0041 BRWN SAND CLAY LYRD 0063
161	4907901	10322460	591237.5	4857863	290.284606	Observation Wells	Not Used		1994-08-19 0:00:00	12.81				12.81	14.335	Boring		Boring	GREY GRVL FILL 0002 BLCK LOAM 0003 GREY SILT CLAY SAND 0016 GREY SILT CLAY 0042 BRWN SAND GRVL LYRD 0062
162	4907959	10322518	591238.5	4857864	290.257843	Dewatering	Not Used		1994-09-26 0:00:00	12.505	1.83			14.945	21.35	Rotary (Convent.)		Rotary (Convent.)	GRVL FILL STNS 0001 BLCK SILT 0002 GREY CLAY SLTY SAND 0009 GREY SILT CLAY 0024 GREY CLAY 0029 GREY CLAY STNS 0031 GREY CLAY SOFT 0039 GREY CLAY STNS 0040 BRWN CLAY SAND 0041 BRWN FSND MSND 0064 BRWN MSND 0071
163	7249510	1005717669	591201	4857865	289.552764	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
164	7249511	1005717771	591201	4857865	289.552764	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
165	4910304	11694185	591209	4857867	289.752807	Observation Wells	Not Used		2006-08-31 0:00:00			0	2.4000000954	2.0999999905	2.400000095	Other Method		Other Method	BLCK LOAM 0001 BRWN SAND 0008
166	7316490	1007247783	591251	4857870		Dewatering	Dewatering		2018-07-16 0:00:00	24.4	0.93025	0	24.4	31.72	24.4	Rotary (Convent.)		Rotary (Convent.)	BRWN CSND FILL 0005 BLCK PEAT SOFT 0008 BRWN FSND 0012 GREY CLAY SILT SOFT 0040 BRWN FSND 0104 BRWN FSND SILT 0109
167	7316490	1007247783	591251	4857870		Dewatering	Dewatering		2018-07-16 0:00:00	24.4	0.93025	24.4	31.72	31.72	24.4	Rotary (Convent.)		Rotary (Convent.)	
168	7316492	1007247789	591251	4857870		Observation Wells	Monitoring		2018-07-16 0:00:00	30.5		0	30.805	29.89	23.79	Rotary (Convent.)		Rotary (Convent.)	BRWN GRVL SAND FILL 0005 BRWN LOAM PEAT SOFT 0008 BRWN FSND 0013 GREY CLAY SILT 0039 BRWN FSND 0050 BRWN GRVL SAND 0055 BRWN SAND 0101
169	7300248	1006845902	591258	4857874	290.052917	Abandoned-Other	Municipal		2017-11-21 0:00:00										
170	7243785	1005445692	591252	4857876	289.993255	Abandoned-Other	Municipal	Monitoring	2015-06-26 0:00:00										
171	7300247	1006845899	591253	4857880	289.92453	Abandoned-Other	Public	Municipal	2017-11-21 0:00:00										
172	7154738	1003411126	591264	4857888	289.784027	Test Hole	Monitoring and Test Hole		2010-03-09 0:00:00			0	45			Auger		Auger	BLCK FILL 0023 BRWN SAND WBRG 0036 GREY CLAY SOFT 0062 GREY SAND CLAY SILT 0095 GREY CLAY 0121 GREY FSND CLAY 0135 GREY CSND WBRG 0148

OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
173	7243810	1005445864	591264	4857888	289.784027	Abandoned-Other	Monitoring		2015-06-15 0:00:00										
174	7154738	1006136551	591260	4857889		Test Hole	Monitoring and Test Hole		2010-03-10 0:00:00			20	15	20			AUGER		
175	7243809	1005445861	591260	4857889	289.771697	Abandoned-Other	Monitoring		2015-06-15 0:00:00										
176	7300283	1006841663	591258	4857895	289.680023	Abandoned-Other	Monitoring		2017-11-21 0:00:00										
177	7257446	1005881382	591258	4857895	289.671813	Observation Wells	Monitoring		2015-12-22 0:00:00		0	22.875	19.825	22.875		Rotary (Convent.)		Rotary (Convent.)	BRWN SAND GRVL HARD 0006 BRWN SAND SOFT 0015 GREY SILT CLAY SOFT 0040 GREY SAND SILT SOFT 0075
178	7338336	1007555592	591217	4857901		Observation Wells	Monitoring		2019-05-31 0:00:00	3.099999905	0	4.5999999046	1.5	4.599999905		Auger		Auger	BRWN CLAY 0015
179	7249512	1005717774	591279	4857908	289.395782	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
180	7249513	1005717777	591279	4857908	289.395782	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
181	7249509	1005717639	591218	4857916	289.318145	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
182	7249507	1005717619	591218	4857917	289.32846	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
183	7249508	1005717636	591218	4857917	289.32846	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
184	4900032	10314880	591171.5	4857921	289.946594	Test Hole	Not Used		1959-01-25 0:00:00	30.805	1.22					Cable Tool		Cable Tool	BRWN MSND 0002 BLCK MUCK MSND 0016 GREY CLAY 0018 QSND 0046 QSND GRVL 0048 CLAY FSND 0062 QSND 0101 QSND GRVL 0102 CLAY MSND 0119 HPAN SHLE 0123
185	4900032	10314880	591171.5	4857921	289.946594	Test Hole	Not Used		1959-01-25 0:00:00	14.03	1.22					Cable Tool		Cable Tool	
186	4904257	10319045	591239.5	4857923	289.213012	Water Supply	Municipal		1972-08-16 0:00:00	21.655	10.065		24.095	30.195		Cable Tool		Cable Tool	BRWN CLAY SILT SAND 0021 GREY CLAY SILT 0035 CLAY SILT 0042 HPAN 0044 SAND CLAY 0068 HPAN 0071 FSND 0075 FSND 0103
187	4904257	10319045	591239.5	4857923	289.213012	Water Supply	Municipal		1972-08-16 0:00:00	13.42	10.065		24.095	30.195		Cable Tool		Cable Tool	
188	4900675	10315523	591080.5	4857930	290.71817	Water Supply	Domestic		1954-09-17 0:00:00	46.36	21.96					Cable Tool		Cable Tool	YLLW CLAY 0006 YLLW MSND 0023 BLUE CLAY 0080 QSND 0121 BLUE CLAY 0152 FSND 0160
189	4910121	11555355	591224	4857939	289.425048	Abandoned-Other	Not Used		2006-02-15 0:00:00	0.800000012	0	8	4.5	8		Rotary (Convent.)		Rotary (Convent.)	BRWN FILL SNDY 0006 BRWN PEAT 0010 SILT 0025 GREY CLAY SLTY 0026
190	7249514	1005717780	591313	4857978	288.623687	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
191	7249515	1005717783	591313	4857978	288.623687	Abandoned-Other	Monitoring		2015-09-28 0:00:00										
192	4910303	11694184	591316	4857985	288.60205	Observation Wells	Not Used		2006-08-31 0:00:00		0	2.4000000954	2.099999905	2.400000095		Other Method		Other Method	BLCK LOAM 0001 BRWN SAND 0008
193	7208935	1004591961	591130	4858008	290.552978	Monitoring and Test Hole	Monitoring and Test Hole		2013-09-13 0:00:00		0	6.1	3.05	6.1		Direct Push		Direct Push	BLCK BRWN SAND SILT GREY CLAY SILT
194	4909686	11323419	590949	4858010	291.928253	Observation Wells			2004-05-05 0:00:00		0	7.3000001907	4.199999809	7.300000191		Other Method		Other Method	LOAM 0001 BRWN SILT SAND GRVL 0006 BRWN CSND 0009 BRWN PEAT 0010 BRWN SILT 0012 GREY FSND 0016 GREY SILT FSND 0024
195	7249506	1005717616	590949	4858010	291.930541	Abandoned-Other	Monitoring		2015-09-25 0:00:00										
196	7208933	1004591955	591141	4858018	290.773986	Monitoring and Test Hole	Monitoring and Test Hole		2013-09-13 0:00:00		0	6.1	3.05	6.1		Direct Push		Direct Push	BLCK 0004 BRWN SAND SILT 0010 GREY CLAY SILT 0020
197	4900038	10314886	591090.4	4858021	290.952392	Water Supply	Municipal		1960-08-15 0:00:00	11.895	0.915		19.825	22.875		Cable Tool		Cable Tool	LOAM 0002 MSND SILT 0020 BLUE CLAY 0039 GRVL MSND CLAY 0046 MSND SILT 0049 FSND 0059 MSND 0067 FSND SILT 0117
198	7208934	1004591958	591136	4858022	290.865783	Monitoring and Test Hole	Monitoring and Test Hole		2013-09-13 0:00:00		0	6.1	3.05	6.1		Direct Push		Direct Push	BLCK 0004 BRWN SAND SILT 0010 GREY CLAY SILT 0020
199	4900676	10315524	590819.5	4858029	293.120971	Test Hole	Not Used		1958-12-22 0:00:00	25.315	0.61					Cable Tool		Cable Tool	BLCK LOAM 0001 BRWN CLAY FSND STNS 0018 GREY FSND 0035 GREY FSND CLAY 0041 QSND 0066 GREY CLAY 0078 HPAN SHLE 0081 SHLE MSND 0126
200	4900676	10315524	590819.5	4858029	293.120971	Test Hole	Not Used		1958-12-22 0:00:00	28.975	0.61					Cable Tool		Cable Tool	
201	7270832	1006236097	591124	4858033	291.18927														
202	4909685	11323418	591128	4858035	291.249114	Observation Wells			2004-05-04 0:00:00		0	7.5999999046	4.300000191	7.300000191		Other Method		Other Method	BRWN LOAM 0001 BRWN SILT CLYY 0005 BRWN SILT FSND 0010 BRWN SILT SAND CLAY 0025
203	7249504	1005717610	591128	4858035	291.244262	Abandoned-Other	Monitoring		2015-09-25 0:00:00										
204	7043250	11765651	591107	4858051	291.771026	Observation Wells			2007-03-29 0:00:00		0	6.4000000954				Other Method		Other Method	BLCK FILL 0001 BRWN SAND GRVL 0009 BRWN GRVL SAND 0016 GREY SILT 0021

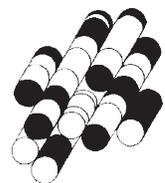
OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
205	7043256	11765657	591107	4858051	291.771026	Observation Wells			2007-03-30 0:00:00			0	4.8800001144	1.830000043	4.880000114	Other Method		Other Method	BLCK FILL 0001 BRWN SAND SILT 0012 BRWN SILT SAND 0016
206	7181212	1003789616	590952	4858083	292.895996	Test Hole	Monitoring and Test Hole		2012-04-23 0:00:00			0	3.66	0.61	3.66	Direct Push		Direct Push	BRWN LOAM 0001 BRWN SAND 0003 BRWN SAND SILT 0012
207	7268566	1006201364	591403	4858089	290.355133	Abandoned-Other	Monitoring		2016-07-12 0:00:00										
208	7181211	1003789613	590901	4858091	292.910095	Test Hole	Monitoring and Test Hole		2012-04-23 0:00:00			0	3.66	0.61	3.66	Direct Push		Direct Push	BRWN LOAM 0001 BRWN SAND 0003 BRWN SAND SILT 0012
209	4908767	10323301	590923	4858096	293.04776	Abandoned-Other			2001-04-24 0:00:00							Not Known		Not Known	
210	7181213	1003789619	590939	4858117	293.451354	Test Hole	Monitoring and Test Hole		2012-04-23 0:00:00			0	3.66	0.61	3.66	Direct Push		Direct Push	BRWN LOAM 0001 BRWN SAND 0003 BRWN SAND SILT 0012
211	7211171	1004636569	590941	4858120	293.515075	Monitoring and Test Hole	Monitoring and Test Hole		2013-07-29 0:00:00			0	6.1	4.575	6.1	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND GRVL 0020
212	7213634	1004671822	590705	4858149	294.032867				2013-09-27 0:00:00										
213	4910105	11555339	591304	4858150	293.110015	Observation Wells	Not Used		2005-07-28 0:00:00	44.225		0	45.75	36.6	44.225	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND SILT 0020 BRWN SAND 0028 BRWN SILT SAND 0038 BRWN SILT CLAY LYRD 0082 GREY CLAY SILT LYRD 0105 BRWN SAND 0141 GREY CLAY 0150
214	4910106	11555340	591304	4858150	293.110015	Observation Wells	Not Used		2005-07-28 0:00:00	10.37		0	10.37	7.32	10.37	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND SILT 0020 BRWN SAND 0028 BRWN SAND SILT 0034
215	4910105	11555339	591304	4858150	293.110015	Observation Wells	Not Used		2005-07-28 0:00:00	36.6		0	45.75	36.6	44.225	Rotary (Convent.)		Rotary (Convent.)	
216	7173515	1003619530	590863	4858157	293.459808	Observation Wells	Monitoring and Test Hole		2011-05-10 0:00:00			0	6.1	1.525	6.1	Direct Push		Direct Push	BRWN SAND GRVL SOFT 0010 GREY SAND WBRG 0020
217	7163746	1003516528	590863	4858157	293.459808	Monitoring and Test Hole	Monitoring and Test Hole		2011-05-10 0:00:00			0	6.1	3.05	6.1	Other Method	DIRECT PUSH	Other Method	BRWN SAND GRVL SOFT 0010 GREY SAND WBRG 0020
218	7163747	1003516530	590863	4858157	293.459808	Monitoring and Test Hole	Monitoring and Test Hole		2011-05-10 0:00:00			0	6.1	1.525	6.1	Other Method	DIRECT PUSH	Other Method	BRWN SAND GRVL SOFT 0010 GREY SAND WBRG 0020
219	7163748	1003516532	590863	4858157	293.459808	Monitoring and Test Hole	Monitoring and Test Hole		2011-05-10 0:00:00			0	6.1	1.525	6.1	Other Method	DIRECT PUSH	Other Method	BRWN SAND GRVL SOFT 0010 GREY SAND WBRG 0020
220	4905642	1003445998	591417	4858178	292.158172	Water Supply	Municipal		1979-05-24 0:00:00	32.635	5.09045			39.65	45.75	Cable Tool		Cable Tool	BRWN FSND MSND 0012 BRWN FSND CLAY STNS 0108 BRWN FSND CLAY 0138 BRWN FSND STNS 0155 GREY CLAY SHLE 0158
221	4910208	11555442	591412	4858181	292.29425	Abandoned-Other	Not Used		2006-05-23 0:00:00	8				43.29999924	45	Rotary (Convent.)		Rotary (Convent.)	
222	4910205	11555439	591412	4858181	292.29425	Abandoned-Other	Not Used		2006-05-23 0:00:00	8				42	45	Rotary (Convent.)		Rotary (Convent.)	
223	4910209	11555443	591414	4858185	292.376495	Abandoned-Other	Not Used		2006-05-23 0:00:00	6				42.5	45.5	Rotary (Convent.)		Rotary (Convent.)	
224	4910104	11555338	591415	4858187	292.419189	Observation Wells	Not Used		2005-07-25 0:00:00	10.98		0	10.98	7.93	10.98	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND SILT 0036
225	7045718	11768157	591415	4858187	292.419189	Observation Wells	Not Used		2005-07-25 0:00:00	38.43		0	44.53	38.43	44.53	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND SILT 0087 GREY CLAY SOFT 0111 BRWN SAND CLAY STNS 0146
226	7045718	11768157	591415	4858187	292.419189	Observation Wells	Not Used		2005-07-25 0:00:00	44.53		0	44.53	38.43	44.53	Rotary (Convent.)		Rotary (Convent.)	
227	4910206	11555440	591412	4858188	292.473571	Abandoned-Other	Not Used		2006-05-23 0:00:00	6		0	7	4	7	Rotary (Convent.)		Rotary (Convent.)	
228	7321280	1007303471	590789	4858201			Monitoring			2.400000095				1.899999976	4.900000095	Boring		Boring	
229	7219791	1004735374	591052	4858258	295.75592	Abandoned-Other			2014-04-17 0:00:00	1.403		0	1.4945						
230	7268565	1006201361	591530	4858313	292.15744	Abandoned-Other	Monitoring		2016-07-12 0:00:00										
231	7295703	1006745942	591312	4858354	296.139434	Observation Wells	Monitoring		2017-09-12 0:00:00	38.40000153	6.53999996	0	40.799999237	36.90000153	38.40000153	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND CLAY SLTY 0025 BRWN SAND SLTY 0034 BRWN SAND GRVL 0036 BRWN SAND SLTY 0040 BRWN SAND GRVL 0045 BRWN SAND CLAY SLTY 0067 GREY CLAY SAND SLTY 0121 BRWN SAND GRVL 0127 GREY CLAY 0134
232	7295704	1006745945	591311	4858355	296.157012	Observation Wells	Monitoring		2017-09-13 0:00:00		6.44999981	0	13.399999619	10.10000038	13.10000038	Rotary (Convent.)		Rotary (Convent.)	BRWN SAND CLAY SLTY 0025 BRWN SAND SLTY 0034 BRWN SAND GRVL 0036 BRWN SAND SLTY 0040 BRWN SAND GRVL 0044
233	4905724	10320420	590514.4	4858473	301.404083	Water Supply	Livestock	Domestic	1980-05-16 0:00:00	25.315	3.66			25.315	26.23	Rotary (Convent.)		Rotary (Convent.)	SAND CLAY SLTY 0028 CLAY BLDR 0032 RED CLAY 0040 GREY CLAY STNS 0083 SAND STNS 0086
234	7185158	1004102806	591360	4858483	295.38034	Abandoned-Other			2012-07-13 0:00:00										
235	4900041	10314889	591293.4	4858498	296.017547	Test Hole	Not Used		1959-11-26 0:00:00	18.605	2.44			18.605	21.96	Rotary (Convent.)		Rotary (Convent.)	LOAM 0001 MSND GRVL BLDR 0044 FSND 0061 FSND SILT CLAY 0083

OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
236	4909344	11099346	591120.9	4858501	298.221069	Observation Wells			2002-12-12 0:00:00	7.015				21.045	24.095	Diamond		Diamond	LOAM 0001 BRWN SAND WBRG 0045 GREY SILT 0050 GREY SAND 0055 GREY SILT 0079 GREY SILT TILL 0086 GREY SILT TILL SHLE 0095
237	4900040	10314888	591322.4	4858523	295.476226	Test Hole	Not Used		1959-11-13 0:00:00	16.775	2.44			15.555	18.605	Rotary (Convent.)		Rotary (Convent.)	LOAM 0001 FSND CLAY 0004 MSND GRVL 0015 MSND GRVL BLDR 0031 CSND GRVL 0037 MSND GRVL BLDR 0042 CSND GRVL 0055 MSND CLAY GRVL 0061
238	4900042	10314890	591393.4	4858528	294.693542	Test Hole	Not Used		1959-12-03 0:00:00	15.555	2.44			15.25	18.605	Rotary (Convent.)		Rotary (Convent.)	LOAM 0001 FSND BLDR 0008 MSND GRVL BLDR 0030 MSND GRVL 0041 MSND CLAY 0051 FSND CLAY 0061
239	7232320	1005237155	590561	4858532	304.476562				2014-10-08 0:00:00										
240	4907104	10321665	590516	4858541	304.3656	Water Supply	Domestic		1989-03-10 0:00:00	6.71	5.49					Boring		Boring	BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 BRWN SAND LOOS 0042
241	4905698	10320401	590564.4	4858573	305.082305	Water Supply	Domestic		1978-08-31 0:00:00	18.3	6.1					Cable Tool		Cable Tool	LOAM 0002 SAND CLAY 0020 CLAY GRVL SAND 0050 HPAN 0060
242	7315739	1007234612	590657	4858585		Observation Wells			2018-07-12 0:00:00	3.05		0	6.1	3.05	6.1		AUGER		BLUE SILT SAND 0020
243	4909683	11323416	591466	4858610	295.775238	Observation Wells			2004-05-06 0:00:00			0	10.5	7.40000095	10.39999962	Other Method		Other Method	LOAM 0001 BRWN FSND 0004 BRWN FSND STNS GRVL 0024 GREY CSND CGVL 0034
244	7268571	1006201828	591364	4858614	294.391571	Abandoned-Other	Monitoring		2016-07-08 0:00:00										
245	4910305	11694186	591364	4858614	294.39212	Observation Wells	Not Used		2006-09-06 0:00:00			0	3.2000000477	2.900000095	3.200000048	Other Method		Other Method	BLCK LOAM 0001 BRWN SAND 0010
246	7268570	1006201418	591364	4858615	294.393157	Abandoned-Other	Monitoring		2016-07-08 0:00:00										
247	7268573	1006201870	591364	4858615	294.393157	Abandoned-Other	Monitoring		2016-07-12 0:00:00										
248	7268572	1006201831	591364	4858615	294.393157	Abandoned-Other	Monitoring		2016-07-12 0:00:00										
249	4900034	10314882	591414.4	4858623	295.113677	Test Hole			1959-03-08 0:00:00	13.42	2.745			11.59	13.42	Cable Tool		Cable Tool	LOAM 0002 SAND GRVL CLAY 0016 SAND GRVL 0018 BLDR SAND 0019 SAND GRVL 0024 SAND STNS BLDR 0027 SAND GRVL 0035 CSND GRVL 0040 FSND 0041 GRVL SAND 0044 FSND 0055
250	4900034	10314882	591414.4	4858623	295.113677	Test Hole			1959-03-08 0:00:00	13.42	2.745			8.54	11.59	Cable Tool		Cable Tool	
251	4900034	10314882	591414.4	4858623	295.113677	Test Hole			1959-03-08 0:00:00	4.88	2.745			11.59	13.42	Cable Tool		Cable Tool	
252	4900034	10314882	591414.4	4858623	295.113677	Test Hole			1959-03-08 0:00:00	4.88	2.745			8.54	11.59	Cable Tool		Cable Tool	
253	7315741	1007234618	590684	4858767		Observation Wells	Monitoring		2018-07-12 0:00:00			0	6.1	3.05	6.1		AUGER		BRWN TILL HARD 0020
254	7315738	1007234609	590779	4858814		Observation Wells	Monitoring		2018-07-12 0:00:00			0	9.15	6.1	9.15		AUGER		SAND SILT 0030
255	4905954	10320600	590314.4	4858873	318.538085	Unfinished	Not Used		1982-08-03 0:00:00							Cable Tool		Cable Tool	GRVL 0002 WDFR LOAM LOOS 0010 BRWN CLAY LOOS 0017 BRWN CLAY SAND 0020 BLUE CLAY QSDN 0032 BLUE CLAY SAND SOFT 0103 BLUE CLAY HARD 0105 GRVL 0105
256	7315740	1007234615	590519	4858889		Observation Wells	Monitoring		2018-07-12 0:00:00			0	4.575	1.525	3.05		AUGER		BLUE SAND 0015
257	7336364	1007492702	590214	4858890					2019-06-03 0:00:00										
258	4905322	10320072	590061.6	4858922	319.808288	Water Supply	Domestic		1976-08-09 0:00:00	7.015	3.66					Boring		Boring	BRWN LOAM SNDY 0001 BRWN CLAY SNDY 0033 GREY CLAY SLTY 0034
259	4905970	10320613	590264.4	4858923	314.95935	Water Supply	Public		1982-11-16 0:00:00					33.55	36.6	Rotary (Convent.)		Rotary (Convent.)	FILL SAND GRVL 0004 BLCK LOAM 0005 CLAY SILT SAND 0022 SILT GRVL BLDR 0029 CLAY SILT SOFT 0054 SAND GRVL CLAY 0059 CLAY GRVL 0071 CLAY 0080 BLDR CLAY PCKD 0091 SILT CLAY 0105 SILT CLAY SAND 0110 GRVL SAND BLDR 0119 CLAY GRVL 0130 GRVL SAND CLAY 0131 LMSN
260	7268569	1006201415	590256	4858937	314.151885	Abandoned-Other	Monitoring		2016-07-12 0:00:00										
261	7268568	1006201412	590256	4858937	314.151885	Abandoned-Other	Monitoring		2016-07-12 0:00:00										
262	7185122	1004102250	590158	4858983	319.485626	Alteration	Industrial		2012-07-06 0:00:00					34.09999847	36.90000153				
263	7182709	1003926562	590189	4858984	318.233215	Abandoned-Supply			2012-05-25 0:00:00					35.65999985					
264	7182708	1003926559	590193	4858986	318.04544	Abandoned-Quality			2012-02-08 0:00:00					35.40000153	39.90000153				
265	7250085	1005741214	590544	4859002	308.057373	Abandoned-Other	Monitoring		2015-10-07 0:00:00						0				
266	7284384	1006375665	590547	4859015	307.852813	Abandoned-Other	Monitoring		2017-03-29 0:00:00										
267	4903493	10318327	590134.4	4859023	320.132324	Water Supply	Domestic		1970-06-29 0:00:00	4.575	0.61					Boring		Boring	BRWN LOAM 0001 BRWN MSND 0015 GREY CLAY GRVL 0020
268	4903303	10318142	590154.4	4859053	320.208007	Water Supply	Domestic		1969-09-12 0:00:00	7.625	7.625					Boring		Boring	BLCK LOAM 0001 BRWN CLAY BLDR 0025 GREY MSND CLAY STNS 0030 GREY CLAY 0039

OBJECTID	WELL_ID	BORE_HOLE_ID	x	y	ELEVATION	Final_Status	Use1	Use2	DATE_COMPLETED	Water_Found_Depth_M	Static_Lev_M	Depth_from_M	Depth_to_M	SCRN_TOP_DEPTH_M	SCRN_END_DEPTH_M	METHOD	OTHER_METHOD	qryConstructi onMethod_ METHOD	Formation
269	7227139	1005121093	589861	4859222	330.814727	Abandoned-Other			2014-08-14 0:00:00										
270	4906952	10321513	589733.4	4859285	332.71524	Test Hole	Municipal		1988-04-01 0:00:00							Rotary (Convent.)		Rotary (Convent.)	BRWN CLAY SAND LYRD 0016 BRWN CLAY STNS HARD 0024 GREY CLAY STNS HARD 0068 BRWN CLAY DNSE 0086 GREY CLAY DNSE 0145 BRWN CLAY SAND CMTD 0160 GREY CLAY SAND STNS 0170 RED CLAY SAND STNS 0175 RED CLAY LYRD 0195 RED CLAY ROCK LYRD 0240 GREY SHLE FCRD DNSE

APPENDIX C

TERRAPROBE INC.



Project No. : 1-17-0714

Client : IBI Group

Originated by : SM

Date started : May 16, 2019

Project : Airport Road Improvements

Compiled by : SD

Sheet No. : 1 of 1

Location : Caledon, Ontario

Checked by : RA

Position : E: 595303.6, N: 4853819.6 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Truck-mounted

Drilling Method : Solid stem augers

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV. DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT 'N' VALUE			SHEAR STRENGTH (kPa)					W _p	w	W _L			GR
275.8	GROUND SURFACE																	
275.5	300mm ASPHALTIC CONCRETE																	
0.3	600mm FILL, gravelly sand, some silt, very dense, brown, dry		1	SS	74													28 58 (14)
274.9	FILL, silty clay, trace to some sand, trace gravel, trace organics, firm to stiff, grey, wet		2	SS	14													
0.9			3	SS	8													0 13 62 25
273.4	SILTY CLAY, trace to some sand, trace gravel, stiff to hard, brown, moist (GLACIAL TILL)		4	SS	14													
2.4			5	SS	42													
272.3																		
3.5																		

END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

Project No. : 1-17-0714

Client : IBI Group

Originated by : SM

Date started : May 16, 2019

Project : Airport Road Improvements

Compiled by : SD

Sheet No. : 1 of 1

Location : Caledon, Ontario

Checked by : RA

Position : E: 593607.5, N: 4855512.3 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Truck-mounted

Drilling Method : Solid stem augers

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT 'N' VALUE			SHEAR STRENGTH (kPa)									
							20	40	60	80	100						
294.8	GROUND SURFACE																
293.9	900mm FILL, sand and gravel, some silt, compact, brown, dry		1	SS	26											GR SA SI CL	
293.0	FILL, silty clay, some sand, trace gravel, trace organics, firm to very stiff, grey, moist		2	SS	6											39 51 (10)	
291.1	SILTY CLAY, some sand to sandy, trace gravel, very stiff to hard, brown, moist (GLACIAL TILL)		3	SS	16											3 32 46 19	
			4	SS	19												
			5	SS	53												
			6	SS	38												
			7	SS	52												
			8	SS	100/ 140mm												
			9	SS	50												
286.7	END OF BOREHOLE																

Borehole was dry and open upon completion of drilling.

Project No. : 1-17-0714

Client : IBI Group

Originated by : SM

Date started : May 16, 2019

Project : Airport Road Improvements

Compiled by : SD

Sheet No. : 1 of 1

Location : Caledon, Ontario

Checked by : RA

Position : E: 593599.0, N: 4855504.8 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Truck-mounted

Drilling Method : Solid stem augers

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT 'N' VALUE			SHEAR STRENGTH (kPa)					W _p	w	W _L			GR
294.9	GROUND SURFACE																	
294.0	900mm FILL, gravelly sand, trace to some silt, compact, brown, moist		1	SS	27													
293.1	FILL, silty clay, some sand to sandy, trace gravel, stiff, grey, moist		2	SS	14													
292.0	SILTY CLAY, trace to some sand, trace gravel, firm to stiff, brown, moist (GLACIAL TILL)		3	SS	11													
289.0			4	SS	8													
287.0	SILTY SAND to SANDY SILT, trace to some gravel, trace clay, loose to very dense, brown, moist to wet		5	SS	8													
			6	SS	13													
			7	SS	22													
			8	SS	87													
			9	SS	61													
286.8			10	SS	65													

END OF BOREHOLE

Piezometer installation consists of a 50 mm diameter PVC pipe with a 3.0 m slotted screen.

* Piezometer flush mount casing observed to be destroyed during site visit of June 26, 2019

WATER LEVEL READINGS		
Date	Water Depth (m)	Elevation (m)
Jun 26, 2019	dry	n/a
Jul 10, 2019	dry	n/a

0 32 62 6

resistance to augering at 5.6m

sampler wet at 7.6m

Project No. : 1-17-0714

Client : IBI Group

Originated by : MA

Date started : May 29, 2019

Project : Airport Road Improvements

Compiled by : SD

Sheet No. : 1 of 1

Location : Caledon, Ontario

Checked by : RA

Position : E: 591200.4, N: 4857901.2 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Truck-mounted

Drilling Method : Solid stem augers

ELEV DEPTH (m)	SOIL PROFILE DESCRIPTION	STRAT PLOT	SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
			NUMBER	TYPE	SPT 'N' VALUE			20	40	60	80	100	W _p	W	W _L		
288.5	GROUND SURFACE																
288.3 0.2	150mm ASPHALTIC CONCRETE		1	SS	34		288										
287.8 0.7	550mm FILL , sand, some gravel, trace to some silt, dense, brown, dry to moist		2	SS	22		287										∇ sampler wet at 1.5m
286.4 2.1	PEAT , amorphous, black		3	SS	6		286										
285.6 2.9	SILTY SAND , trace to some gravel, trace clay, trace to some organics, very loose to loose, grey, wet		4	SS	2		285										8 63 25 4
283.3 5.2	CLAYEY SILT , trace to some sand, trace gravel, firm, grey, wet		5	SS	4		284										
282.6 5.9	SAND AND SILT , trace clay, trace gravel, very loose, grey, wet		6	SS	3		283										
281.8 6.7	CLAYEY SILT , trace sand, trace gravel, very soft to stiff, grey, wet		7	SS	5		282										1 59 36 4
277.8 10.7	CLAYEY SILT , trace sand, trace gravel, very soft to stiff, grey, wet		8	SS	4		281										0 0 83 17
			9	SS	0*		280										
			10	SS			279										
			11	SS			278										
			12	SS	8		277										

END OF BOREHOLE

*Sampler sinking under weight of hammer and/ or rods.

Unstabilized water level measured at 1.4 m below ground surface; borehole caved to 1.8 m below ground surface upon completion of drilling.

Project No. : 1-17-0714

Client : IBI Group

Originated by : SM

Date started : May 29, 2019

Project : Airport Road Improvements

Compiled by : SD

Sheet No. : 1 of 1

Location : Caledon, Ontario

Checked by : RA

Position : E: 591218.6, N: 4857896.1 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Geoprobe, truck-mounted

Drilling Method : Solid stem / hollow stem augers

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT 'N' VALUE			SHEAR STRENGTH (kPa)									
288.7	GROUND SURFACE																
288.4	250mm TOPSOIL																
0.3	FILL , silty sand, trace to some gravel, very loose to compact, brown, moist to wet		1	SS	10												
			2	SS	9												
			3	SS	2												
286.6	PEAT , amorphous, black																
2.1			4	SS	5												
			5	SS	0*												
285.0	SAND , some silt, trace clay, trace gravel, very loose to loose, grey, wet																
3.7			6	SS	9												
			7	SS	3												
283.8	CLAYEY SILT , trace sand, trace gravel, soft to stiff, grey, wet																
4.9			8	SS	11												
			9	SS	3												
280.6	END OF BOREHOLE																
8.1																	

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jun 26, 2019	3.1	285.6
Jul 10, 2019	3.4	285.3

Unstabilized water level measured at 1.5m below ground surface; wet cave at 7.2 m below ground surface upon completion of drilling.

Piezometer installation consists of a 50 mm diameter PVC pipe with a 1.5 m slotted screen.

*Sampler sinking under weight of hammer and/ or rods.

file: 1-17-0714-01 bh logs.spp

Project No. : 1-17-0714

Client : IBI Group

Originated by : JQ

Date started : June 3, 2019

Project : Airport Road Improvements

Compiled by : SD

Sheet No. : 1 of 1

Location : Caledon, Ontario

Checked by : RA

Position : E: 590214.5, N: 4858879.9 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Track-mounted

Drilling Method : Solid stem augers

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH (m)	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT 'N' VALUE			SHEAR STRENGTH (kPa)									
316.6	GROUND SURFACE																
315.9	150mm ASPHALTIC CONCRETE		1	SS	49												
0.7	550mm FILL , sand and gravel, trace silt, dense, brown, dry		2	SS	45												
	FILL , silty sand, trace to some gravel, trace clay, compact to dense, brown, moist		3	SS	14												
			4	SS	11												
313.7	PEAT , amorphous, black		5	SS	12												
2.9			6	SS	19												
313.2	CLAYEY SILT , trace sand, very stiff, grey, wet		7	SS	17												
3.4			8	SS	18												
			9	SS	36												
311.4	SILTY SAND to SAND AND SILT , trace clay, trace gravel, compact to dense, grey, wet		10	SS	28												
5.2																	
308.5	END OF BOREHOLE																
8.1	Unstabilized water level measured at 4.0m below ground surface; borehole caved at 5.2 m below ground surface upon completion of drilling.																

Project No. : 1-17-0714

Client : IBI Group

Originated by : JQ

Date started : June 3, 2019

Project : Airport Road Improvements

Compiled by : SD

Sheet No. : 1 of 1

Location : Caledon, Ontario

Checked by : RA

Position : E: 590214.2, N: 4858891.5 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Track-mounted

Drilling Method : Solid stem augers

ELEV DEPTH (m)	SOIL PROFILE DESCRIPTION	STRAT PLOT	SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT (Wp)	NATURAL MOISTURE CONTENT (w)	LIQUID LIMIT (Wl)	UNIT WEIGHT (γ)	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
			NUMBER	TYPE	SPT 'N' VALUE			SHEAR STRENGTH (kPa)										WATER CONTENT (%)
316.6	GROUND SURFACE																	
316.4	150mm ASPHALTIC CONCRETE		1	SS	35		316											GR SA SI CL
315.9	550mm FILL, gravelly sand, trace silt, dense, brown, dry to moist																	25 67 (8)
313.7	FILL, silty sand, trace gravel, compact, brown, moist to wet		2	SS	22													
			3	SS	16													
			4	SS	12													
313.2	PEAT, amorphous, black		5	SS	16													
313.2	SILTY SAND to SAND AND SILT, trace clay, trace gravel, compact, brown to 5m, grey below, wet		6	SS	11													1 53 42 4
			7	SS	16													
			8	SS	16													
			9	SS	24													
308.5	END OF BOREHOLE		10	SS	20		309											

END OF BOREHOLE

Piezometer installation consists of a 50 mm diameter PVC pipe with a 1.5 m slotted screen.

Borehole was dry and open upon completion of drilling.

WATER LEVEL READINGS

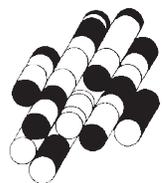
Date	Water Depth (m)	Elevation (m)
Jun 26, 2019	2.0	314.6
Jul 11, 2019	2.2	314.4

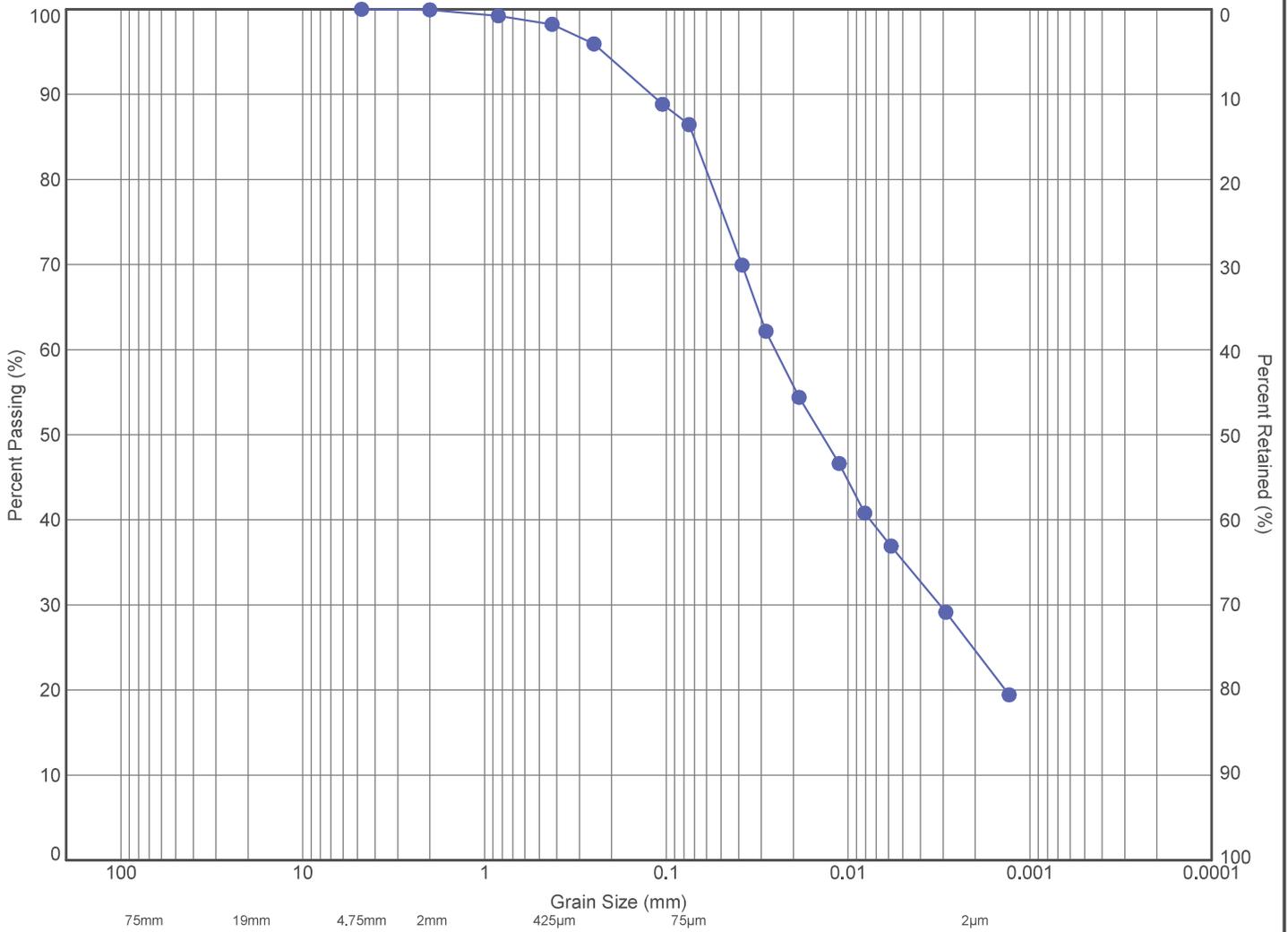
file: 1-17-0714-01 bh logs.spp

+ 3, X 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

APPENDIX D

TERRAPROBE INC.





MTO	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)
● 1	SS3	1.8	274.0	0	13	62	25	



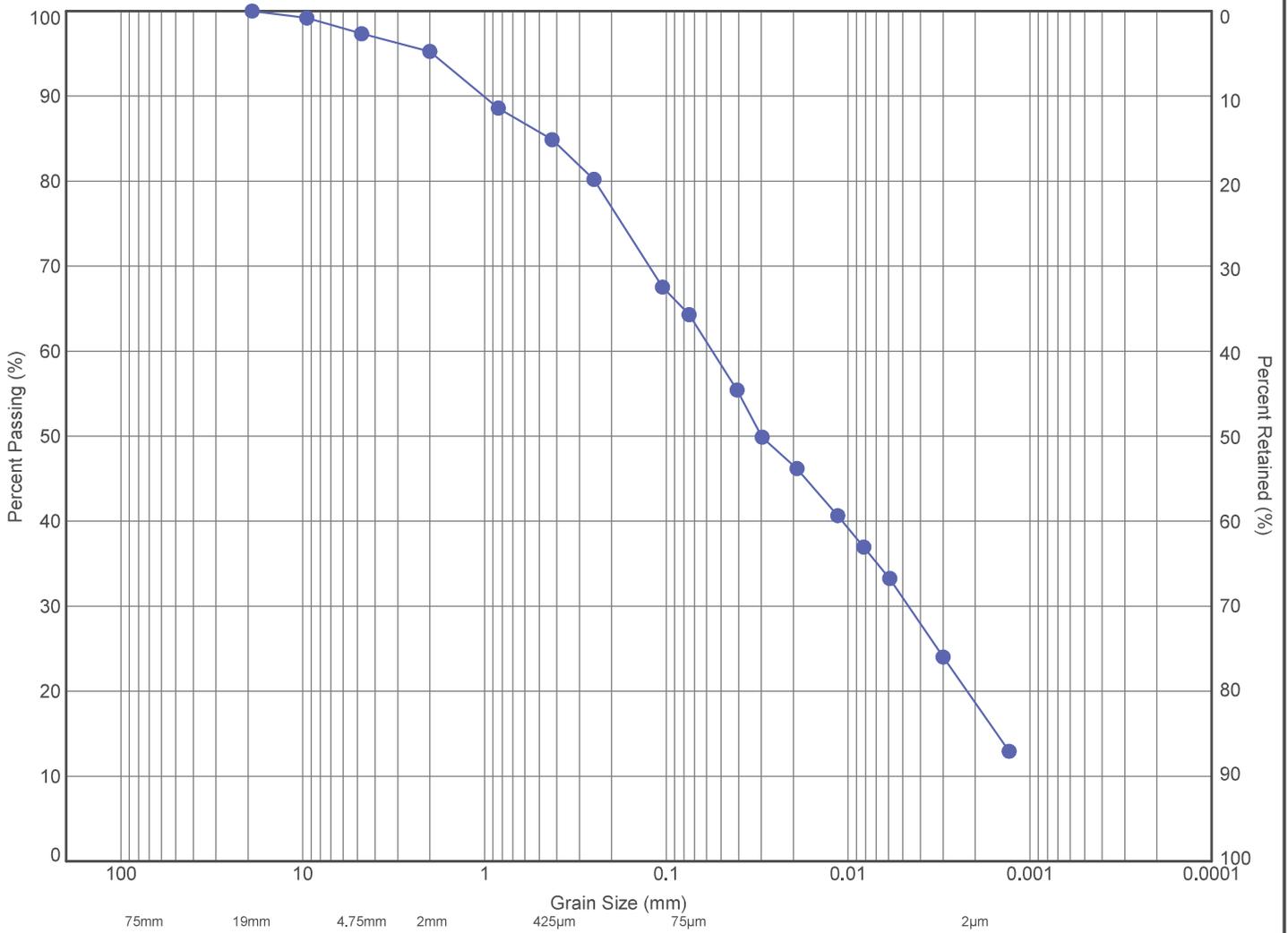
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

**GRAIN SIZE DISTRIBUTION
FIGURE B6 - FILL-SILTY CLAY**

File No.:

1-17-0714



MTO	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)
● 24	SS4	2.5	292.3	3	32	46	19	



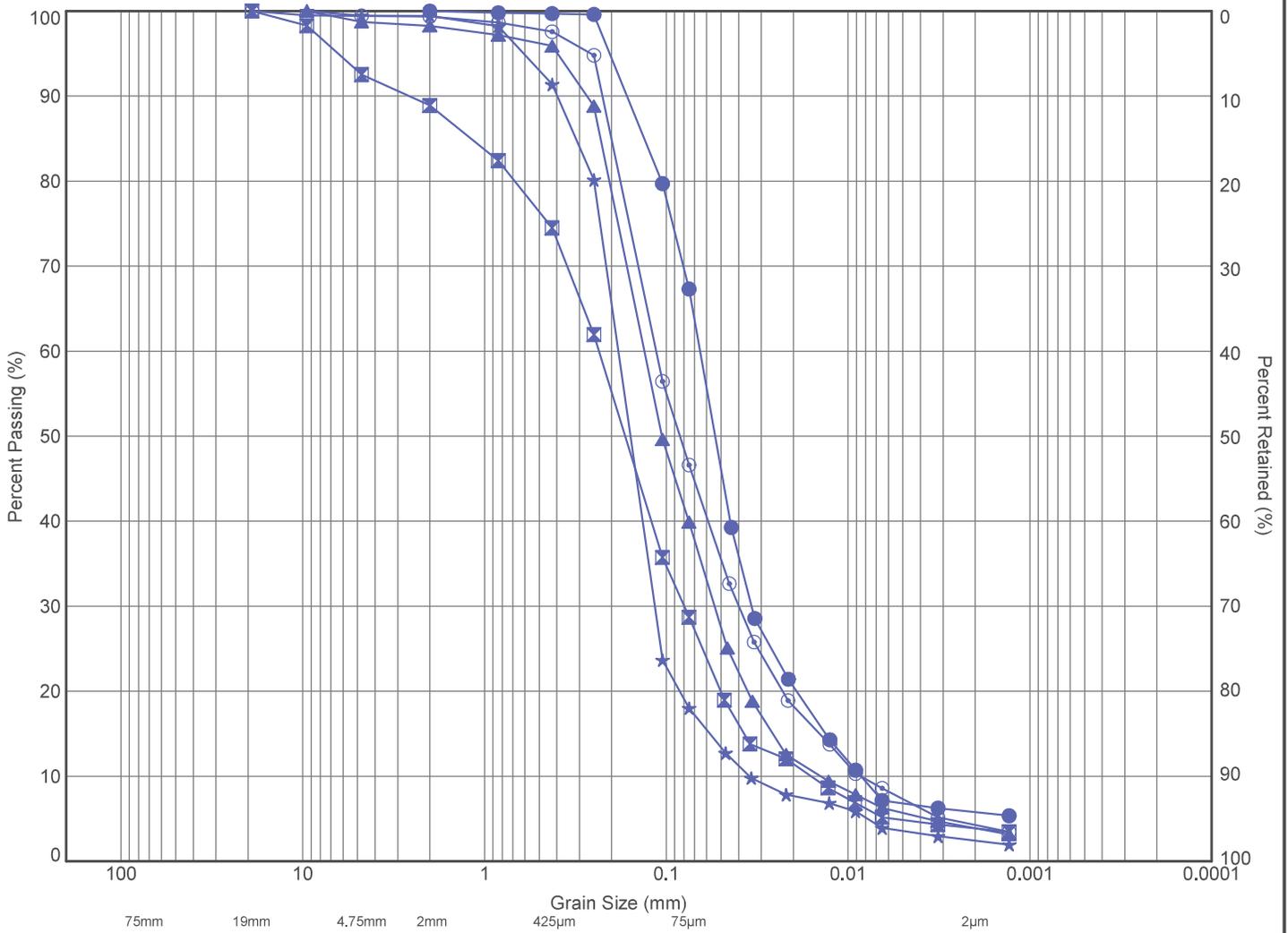
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

**GRAIN SIZE DISTRIBUTION
FIGURE B7 - SILTY CLAY (GLACIAL TILL)**

File No.:

1-17-0714



MTO	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)
● 24A	SS6	4.0	290.9	0	32	62	6	
⊠ 64	SS5	3.3	285.2	8	63	25	4	
▲ 64	SS9	6.3	282.2	1	59	36	4	
★ 64A	SS6	4.0	284.7	1	81	16	2	
⊙ 80A	SS6	4.0	312.6	1	53	42	4	



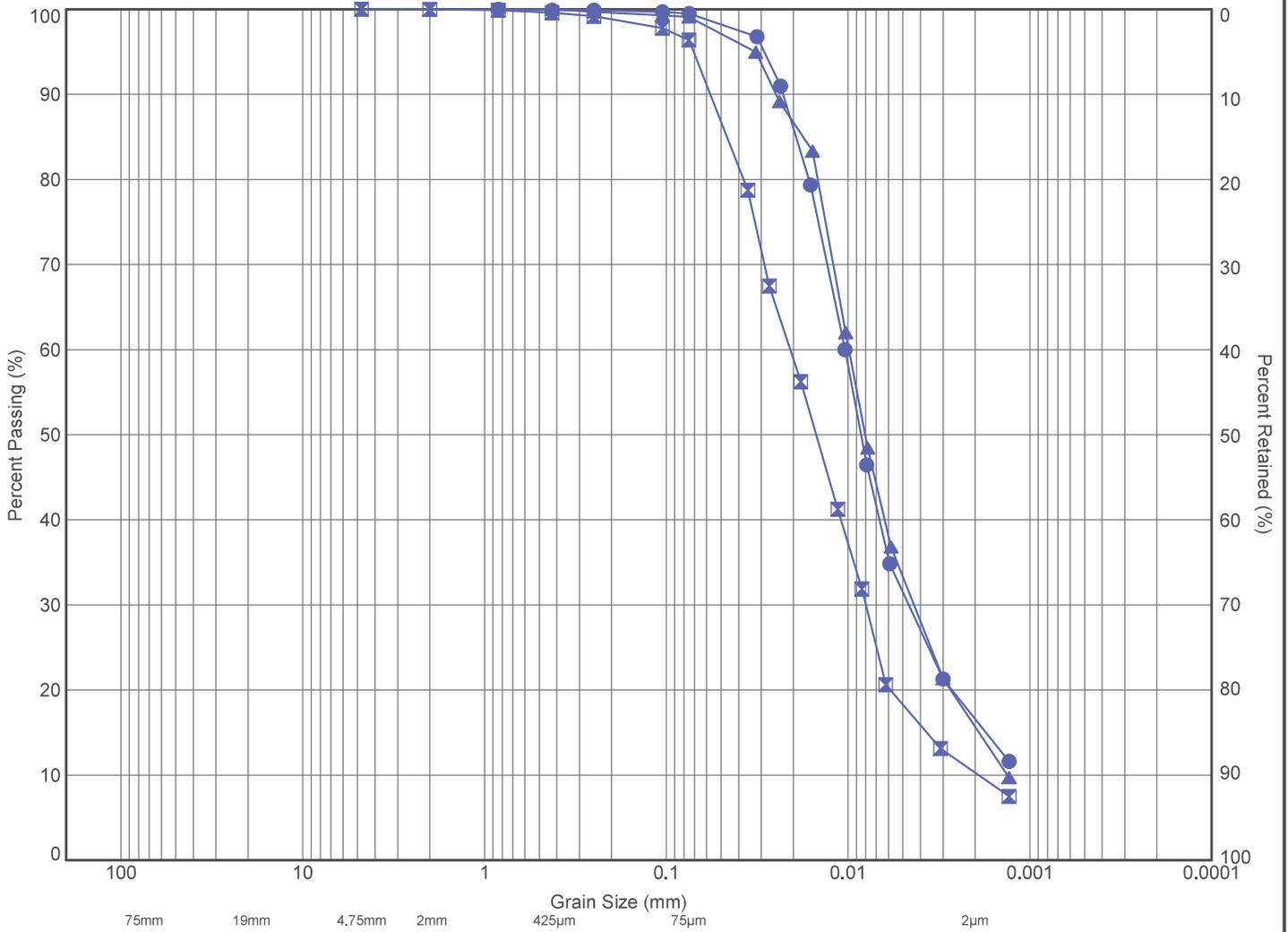
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

**GRAIN SIZE DISTRIBUTION
FIGURE B8 - SAND TO SANDY SILT**

File No.:

1-17-0714



MTO	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)
● 64	SS10	7.1	281.4	0	0	83	17	
☒ 64A	SS8	6.3	282.4	0	4	86	10	
▲ 80	SS6	4.0	312.6	0	1	83	16	



11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

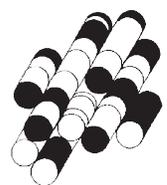
**GRAIN SIZE DISTRIBUTION
FIGURE B9 - CLAYEY SILT**

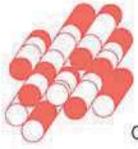
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1-17-0714

APPENDIX E

TERRAPROBE INC.





Terraprobe

Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing

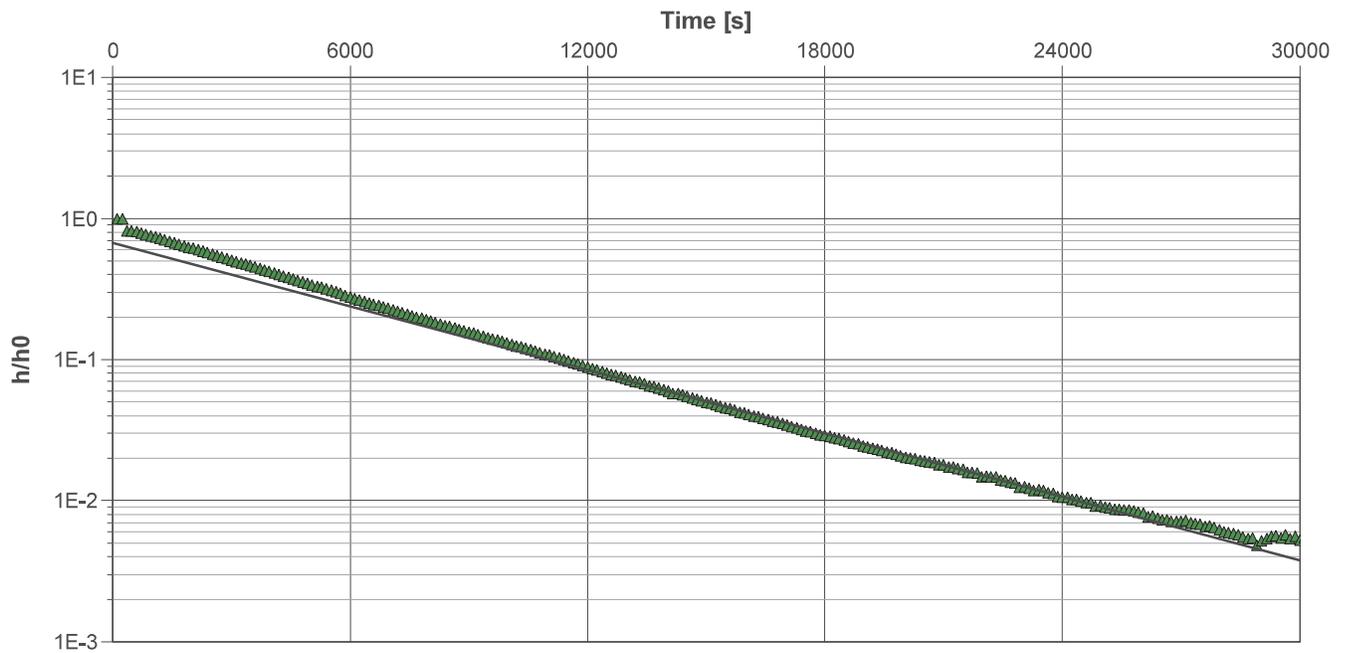
Slug Test Analysis Report

Project: Airport Road Improvements

Number: 1-17-0714-46

Client: IBI Group

Location: Caledon	Slug Test: 80A	Test Well: 80A
Test Conducted by:		Test Date: 6/26/2019
Analysis Performed by: TS	BH80A RHT	Analysis Date: 12/4/2020
Aquifer Thickness: 6.10 m		

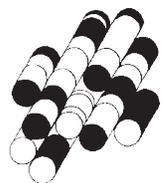


Calculation using Bouwer & Rice

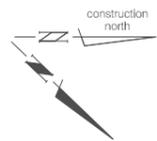
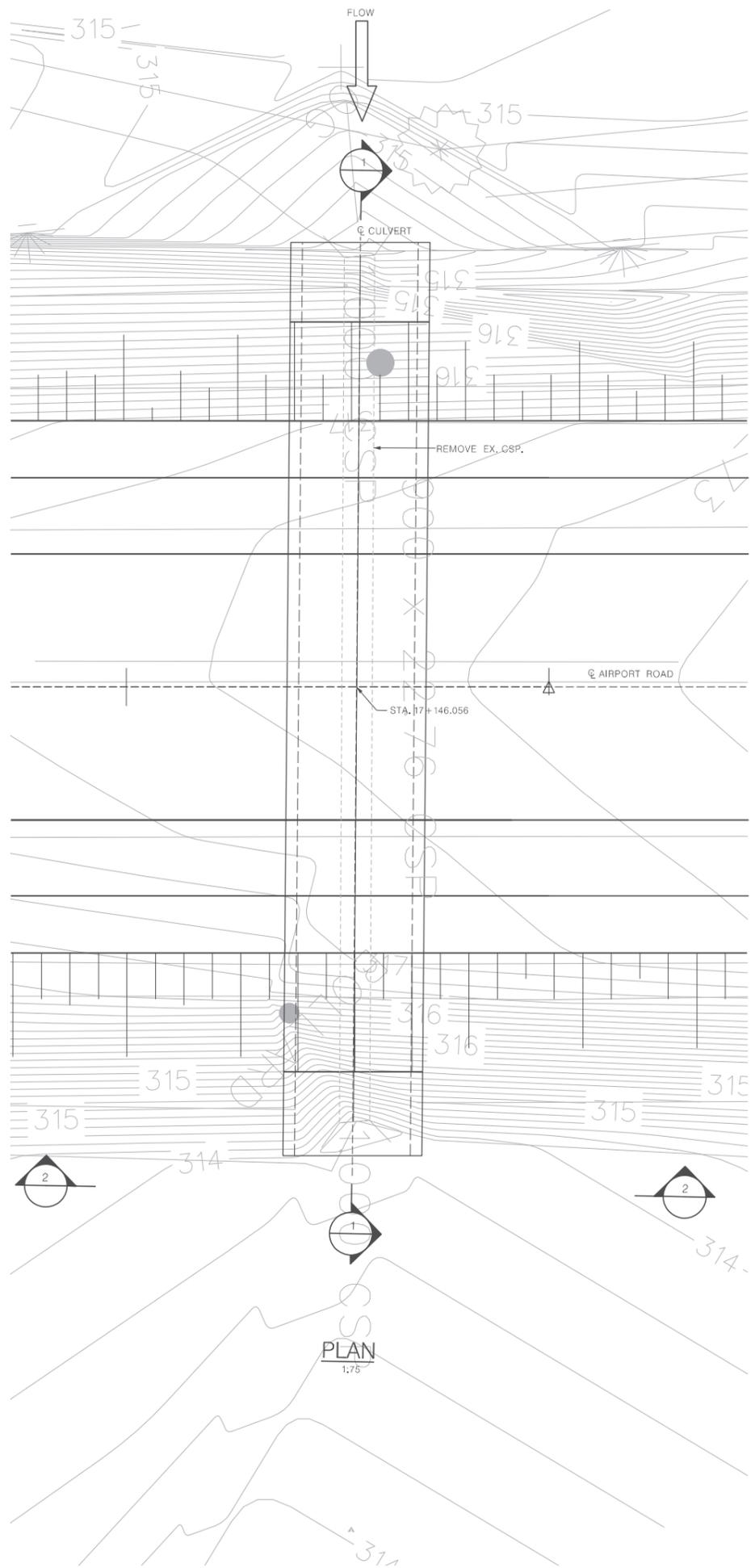
Observation Well	Hydraulic Conductivity [m/s]
80A	1.14×10^{-7}

APPENDIX F

TERRAPROBE INC.



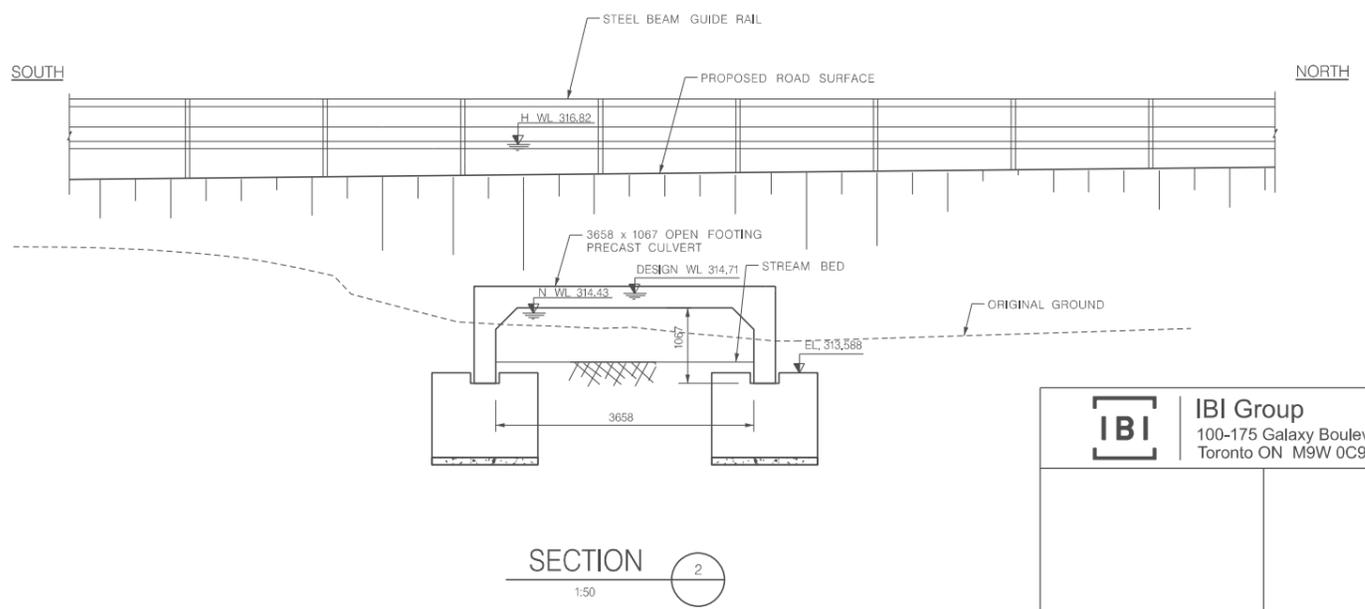
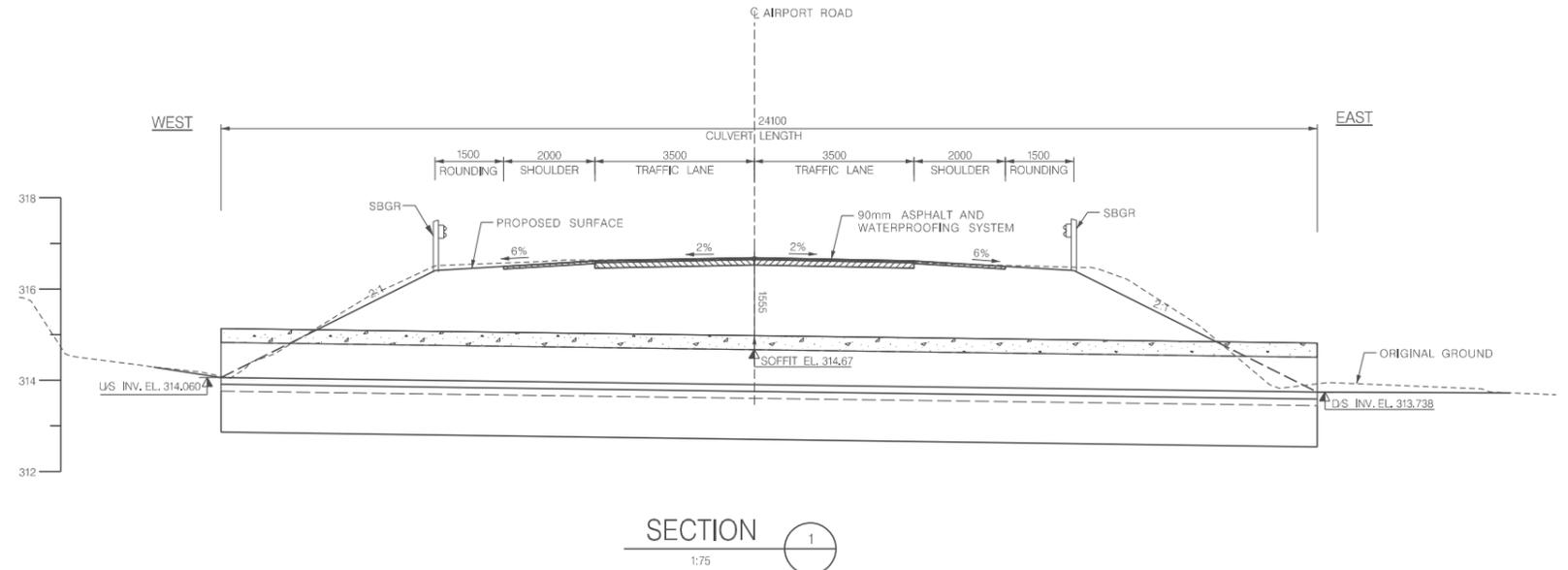
J:\109535_AirportRD_EA\5.9 Drawings\59br\idge#01-GA_STA_17+146.06 Culvert .dgn
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DIMENSIONS ARE IN METRES
 AND/OR MILLIMETRES
 UNLESS OTHERWISE SHOWN

REVISIONS		
DATE	DETAILS	INIT.



IBI Group
 100-175 Galaxy Boulevard
 Toronto ON M9W 0C9 Canada

Region of Peel
 Working for you

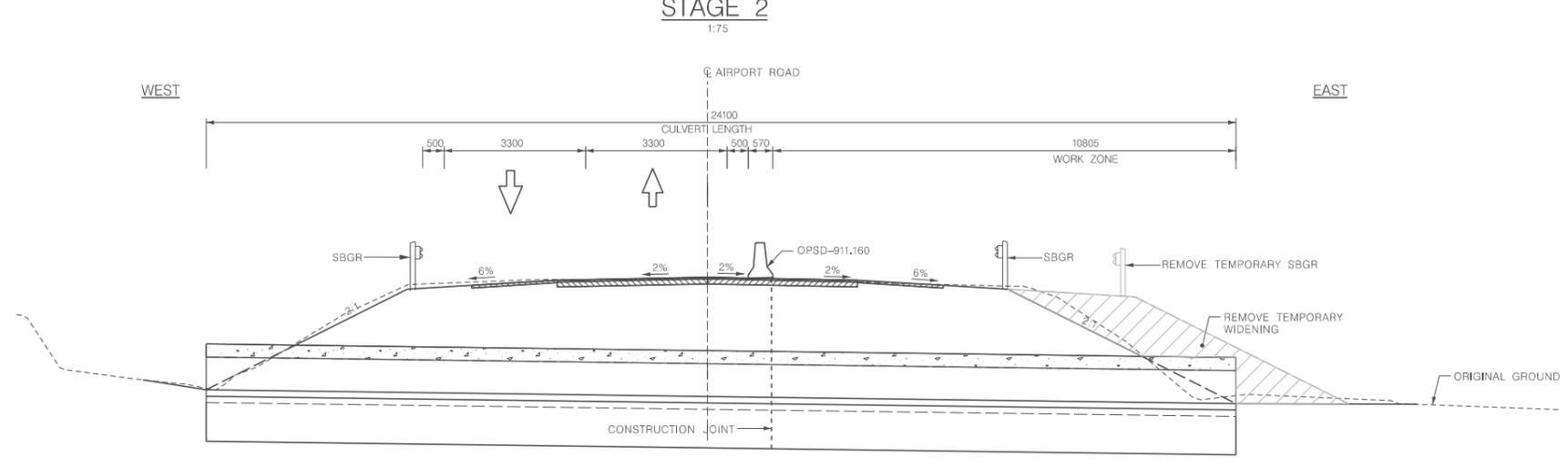
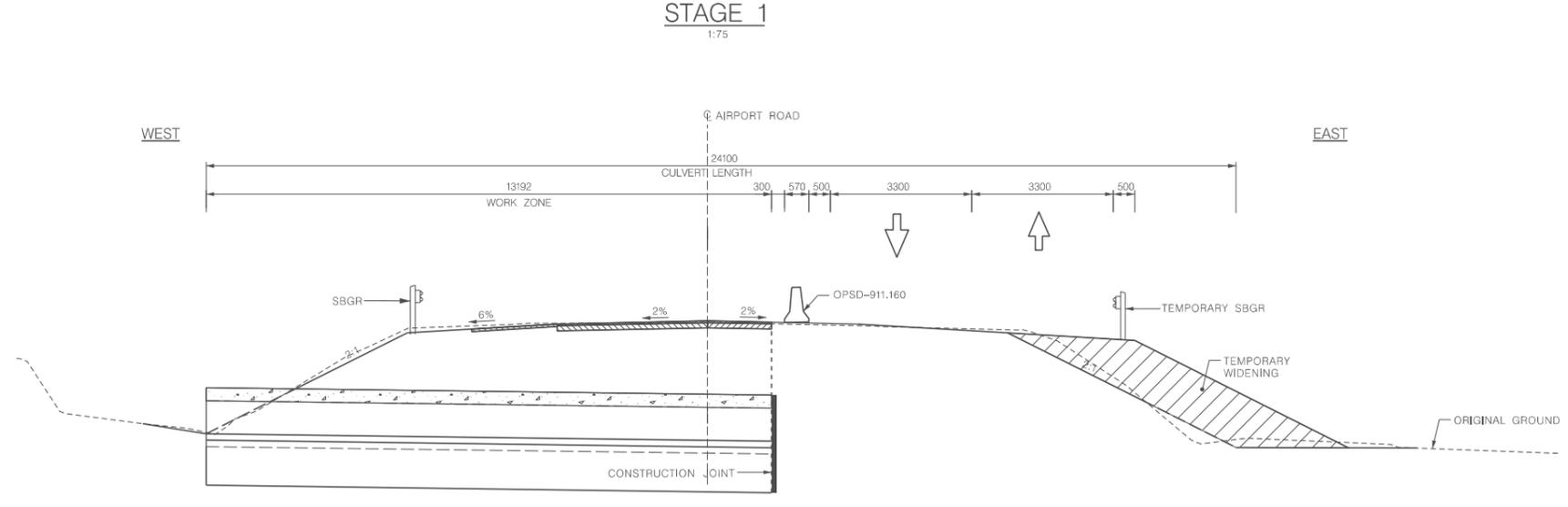
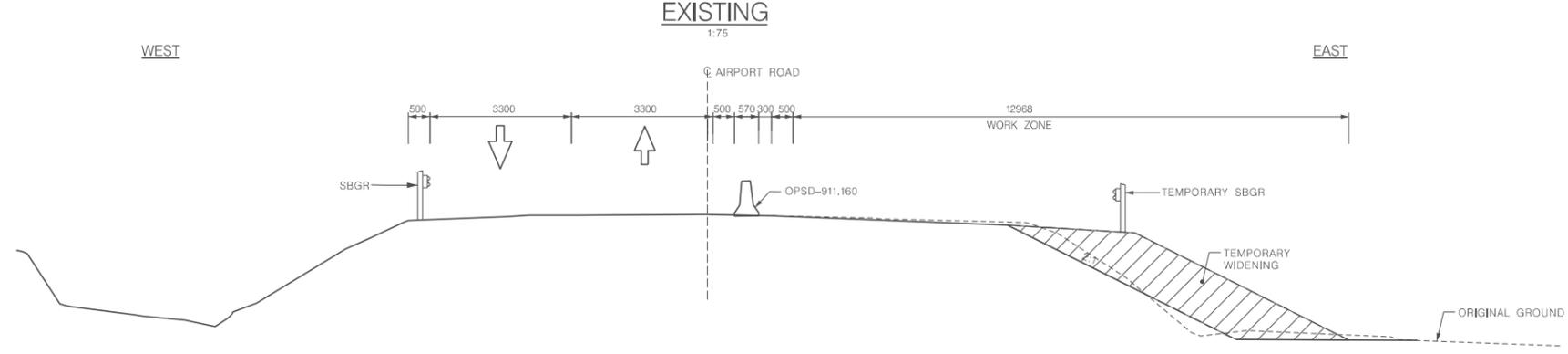
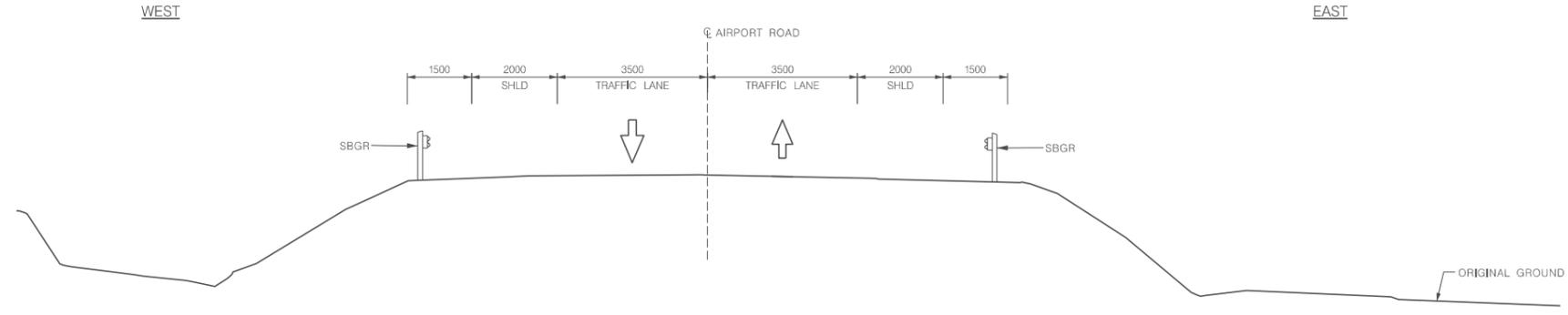
AIRPORT ROAD
 CULVERT AT 17+146.056 (C1)
 PRELIMINARY GENERAL ARRANGEMENT
 UPPER HUNSMILL CULVERT

CAD Area	Area	Project No.
Checked by R.W.	Drawn by J.S.	
Date OCT, 2019	Sheet 1 of 4	Plan No.

DRAWING NOT TO BE SCALED
 100mm ON ORIGINAL DRAWING

REVISIONS		
DATE	DETAILS	INIT.

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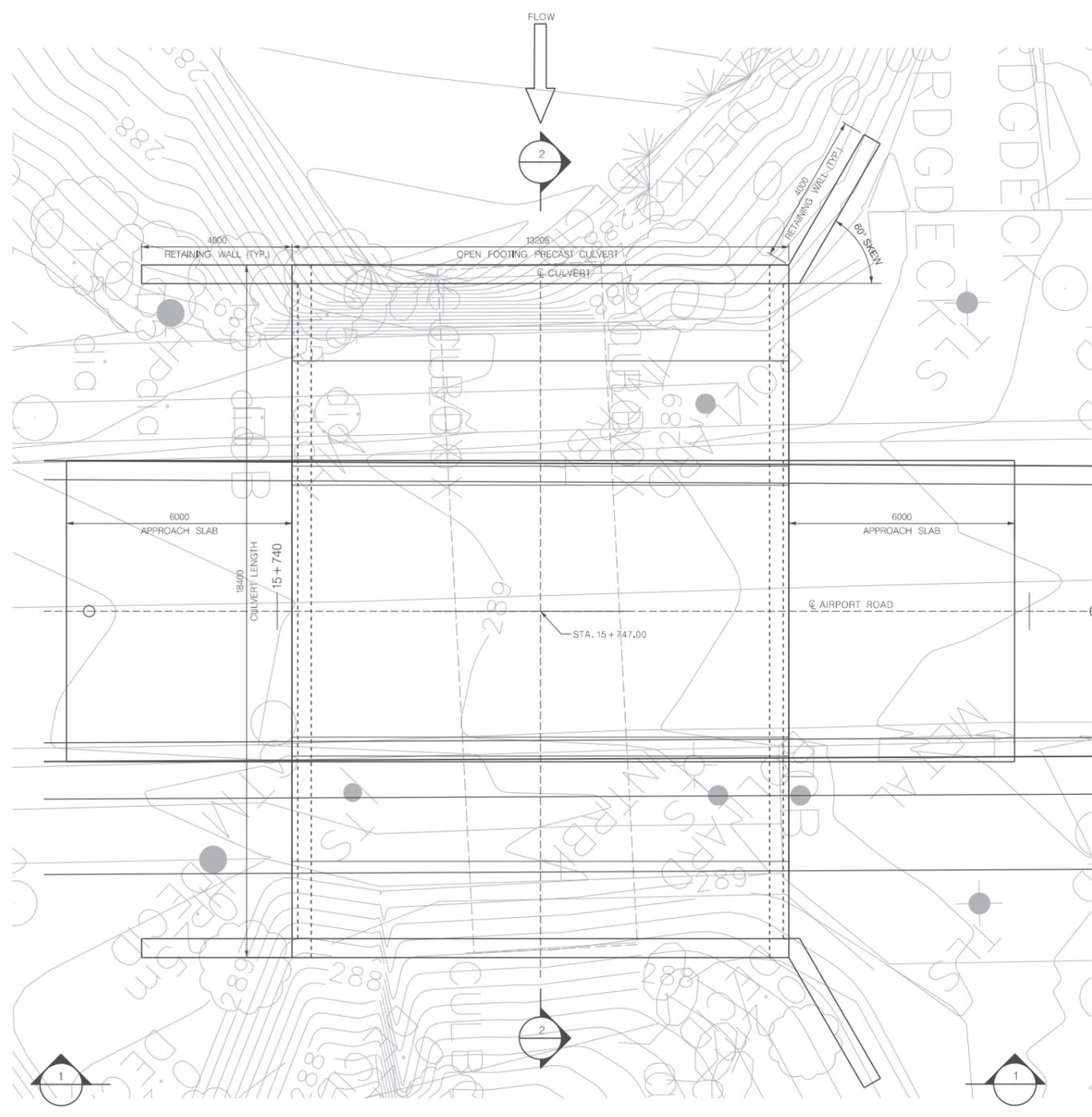
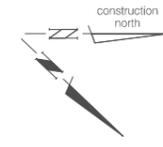
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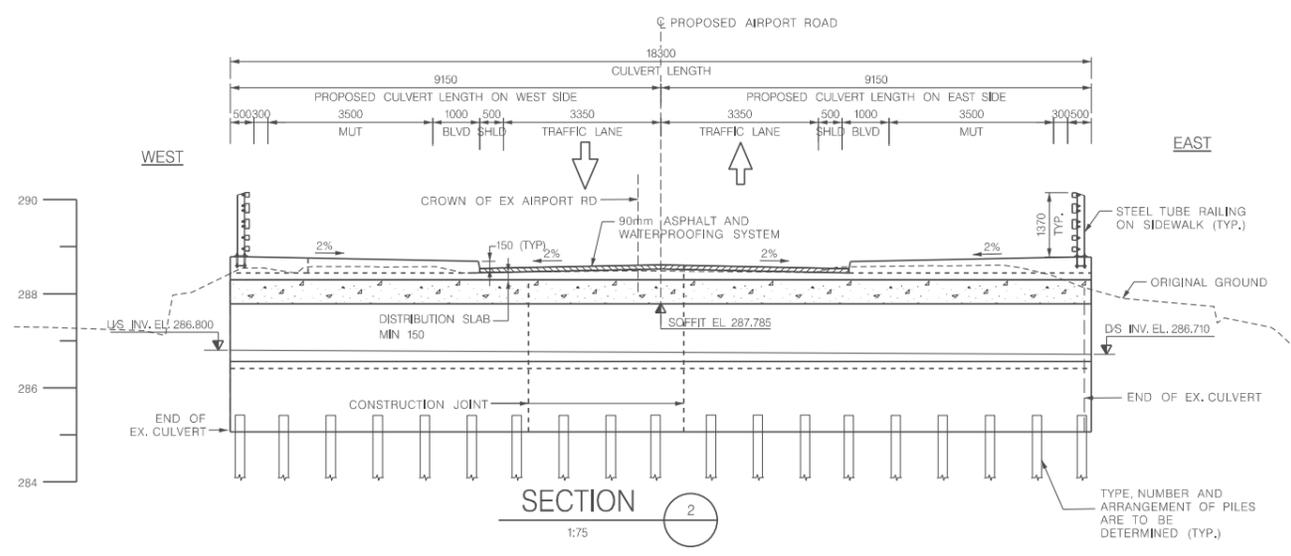
	IBI Group 100-175 Galaxy Boulevard Toronto ON M9W 0C9 Canada	
	Designed by	Approved by
 Region of Peel <i>Working for you</i>		
AIRPORT ROAD CULVERT AT STA 17+146.056 (C1) CONSTRUCTION STAGING UPPER HUNTMILL CULVERT		
CAD Area	Area	Project No.
Checked by R.W.	Drawn by J.S.	
Date OCT, 2019	Sheet 2 of 4	Plan No.

REVISIONS		
DATE	DETAILS	INIT.

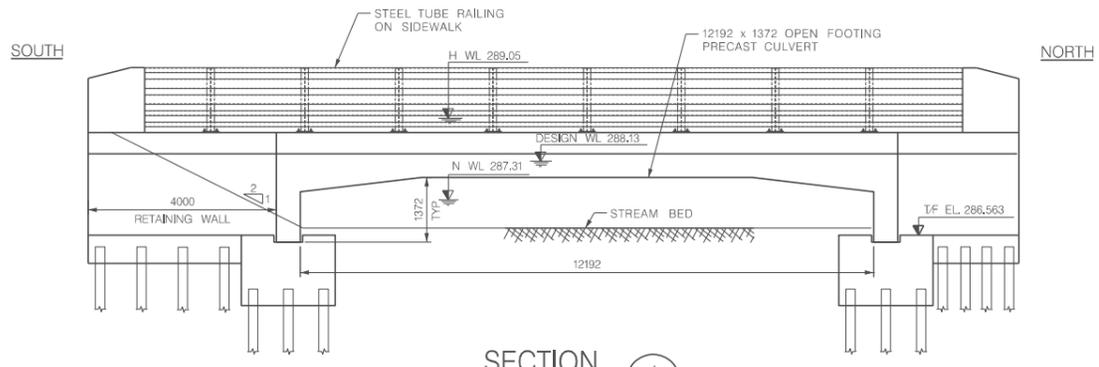
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PLAN
1:75



SECTION 2
1:75



SECTION 1
1:75

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IBI Group
 100-175 Galaxy Boulevard
 Toronto ON M9W 0C9 Canada

Region of Peel
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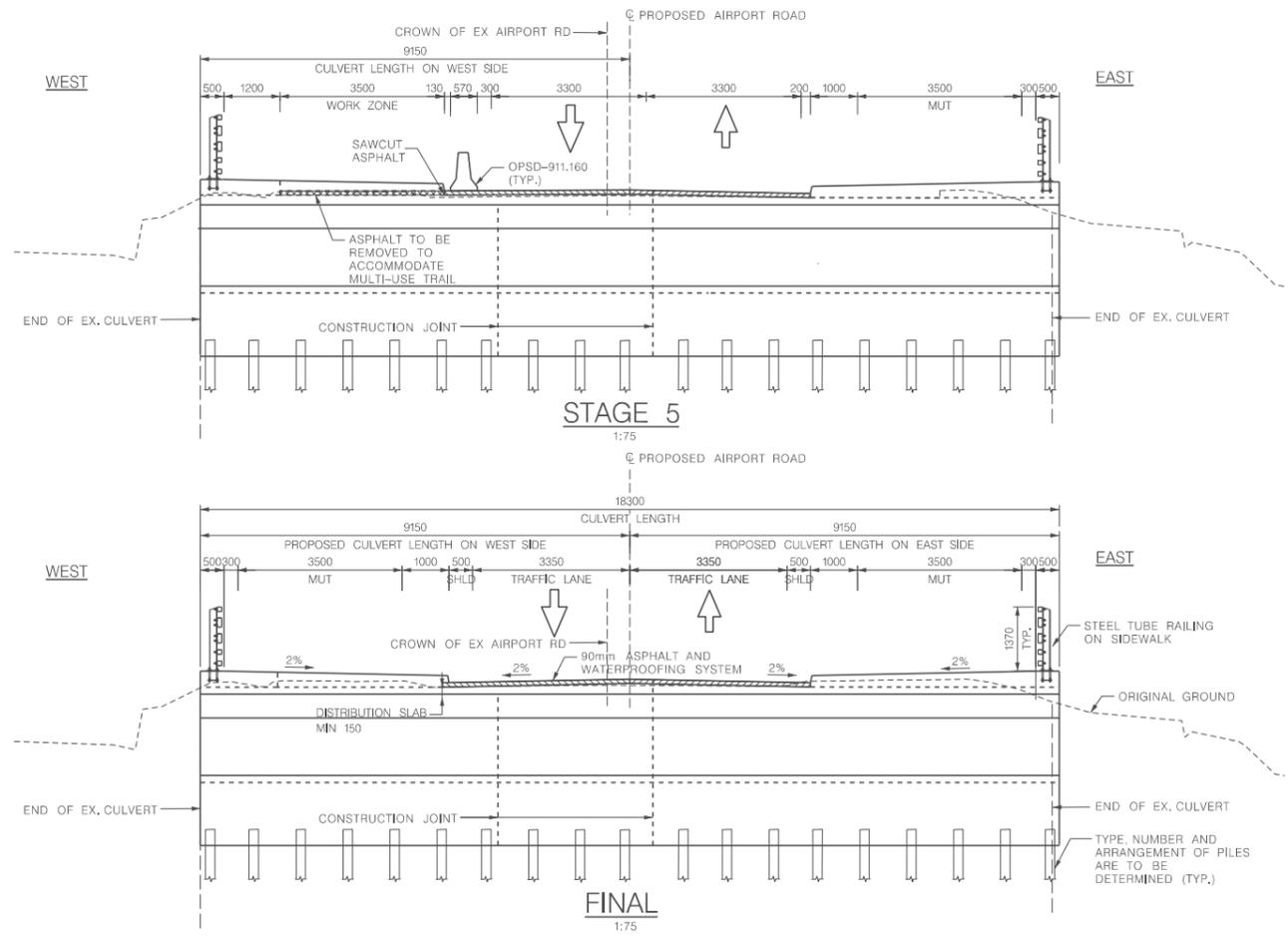
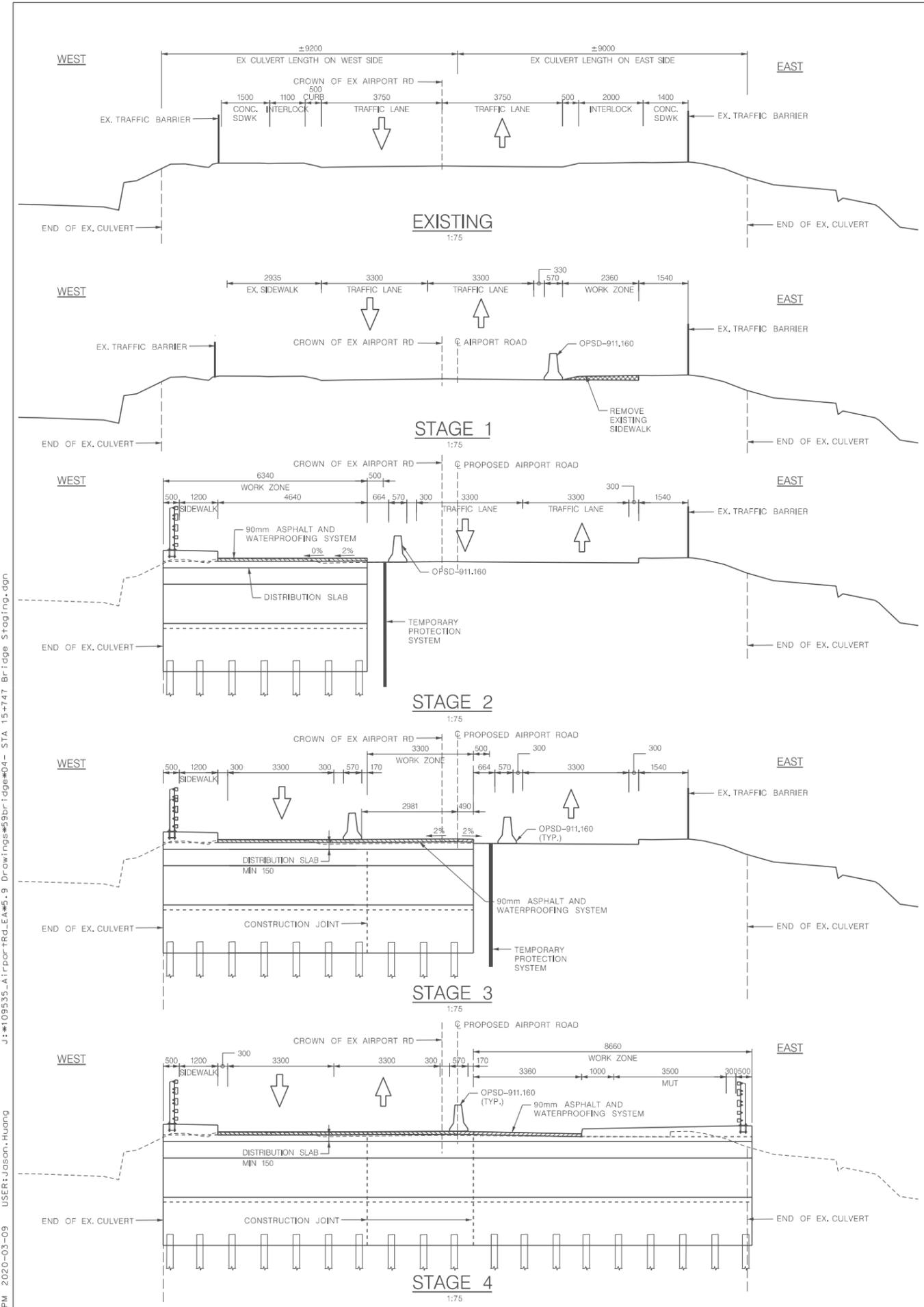
AIRPORT ROAD
 CULVERT AT STA 15+747 (C3)
 PRELIMINARY GENERAL ARRANGEMENT
 CENTERVILLE CREEK BRIDGE

CAD Area	Area	Project No.
Checked by R.W.	Drawn by J.S.	
Date OCT, 2019	Sheet 3 of 4	Plan No.

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REVISIONS		
DATE	DETAILS	INIT.

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NOTE: STAGE 2 & 5 NO SIDEWALK WEST SIDE.
 STAGE 1 & 4 NO SIDEWALK EAST SIDE.

J:\109535_AirportRd_EA\5-9 Drawings\59bridge\04- STA 15+747 Bridge Staging.dgn
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DRAWING NOT TO BE SCALED
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	IBI Group 100-175 Galaxy Boulevard Toronto ON M9W 0C9 Canada	
	Designed by	Approved by
 Region of Peel <i>Working for you</i>		
AIRPORT ROAD CULVERT AT STA 15+747 (C3) CONSTRUCTION STAGING CENTERVILLE CREEK BRIDGE		
CAD Area	Area	Project No.
Checked by R.W.	Drawn by J.S.	
Date OCT, 2019	Sheet 4 of 4	Plan No.