TOWN OF CALEDON
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Proposed Industrial Development

Airport Developments Inc. & Airport II Developments Inc.

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Preliminary Geotechnical Investigation

Project Location:
Airport Road and Mayfield Road, Caledon, Ontario

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Prepared By:
Leo Chui, P. Eng.
Project Manager
Geotechnical Services

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220 Commerce Valley Drive West, Suite 110 | Markham, ON L3T 0A8 | CANADA
t: +1.905.695.3217 | f: +1.905.695.0169 | exp.com

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1. Introduction

This report presents the findings of a preliminary geotechnical investigation conducted for the proposed industrial buildings at the northeast corner of Airport Road and Mayfield Road in Caledon, Ontario. The work was authorized by Ms. Leah Axt of SmartCentres on behalf of Airport Developments Inc.

Based on the latest drawings provided by the client, it is understood that the proposed industrial development will consist of two (2) single storey slab-on-grade structures (Industrial Building 1 and 2) approximately 252,763 and 226,613 square foot in size, respectively. The finished floor elevations (FFE) of Industrial Building 1 and 2 are 235.60 m and 235.50 m, respectively. The grading plan is attached in Appendix B for reference. Initial plans call for a layout parallel with Mayfield Road. Subsequently, the buildings were slightly rotated to be parallel with Airport Road, shifting the buildings.

The purpose of the preliminary geotechnical investigation was to determine the subsurface soil and groundwater conditions at the site by putting down a limited number of sampled boreholes and, based on an assessment of the factual borehole data, to provide preliminary geotechnical engineering guidelines pertaining to the design and construction of the proposed industrial buildings.

The comments and recommendations given in this report are based on the assumption the above-described design concept will proceed into construction. If changes are made either in the design phase or during construction, this office must be retained to review these changes. The result of this review may be a modification of our recommendations or the requirement of additional field or laboratory work to check whether the changes are acceptable from a geotechnical viewpoint.

2. Site Description

The Site is located northeast corner of the intersection of Airport Road and Mayfield Road in the Town of Caledon, Ontario.

The entire proposed development area is approximately 23.31 acres (9.43 hectares) and is currently a piece of vacant land. Historical aerial photos show the site to be previously under agricultural land use. Based on the ground surface elevations at the borehole locations, the site appears to have a rolling topography with elevations ranging from approximately 232.43 m to 236.34 m.

3. Fieldwork

The fieldwork was carried out between June 24 and 25, 2021. Prior to drilling, the borehole locations were cleared of underground utilities by Ontario One Call contractors and a private locator. Eleven (11) boreholes (Boreholes (BH) 1 to 6 and Monitoring Wells (MW) 1 to 5) were advanced to a depth of about 5.0 to 8.1 m below existing grade at the approximate locations shown on the attached Borehole Location Plan (Drawing No. 1).

The boreholes were advanced using continuous flight solid stem augering equipment owned and operated by a specialist drilling contractor. In each borehole, soil samples were recovered using conventional split spoon equipment and standard penetration test methods.

Water levels were observed in the boreholes during the course of the fieldwork and in groundwater monitoring wells installed in all boreholes for the hydrogeological investigation and to establish the short-term groundwater levels at the site.

The fieldwork was supervised by EXP geotechnical staff who monitored the drilling operations and logged the borings. All split spoon samples were transported to our laboratory for detailed examination.

The location and ground surface elevation of the boreholes were determined in the field by EXP Services Inc. Ground surface elevations at the borehole locations were determined from Can-Net Elevations with the use of a Trimble TSC3 Controller.

4. Laboratory Testing

The laboratory testing program comprised the following:

- Moisture content determination on all recovered soil samples, with results presented on the Log of Borehole sheets (Drawing Nos. 2 to 12).

5. Subsurface Conditions

5.1 Soil

The detailed soil profile encountered in each borehole and the results of laboratory moisture content determinations are indicated on the attached borehole logs (Drawing Nos. 2 to 12). It should be noted the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. The “Notes on Sample Descriptions” preceding the borehole logs form an integral part of and should be read in conjunction with this report.

The stratigraphy, as revealed in the boreholes, comprised a surficial topsoil over fill (possible reworked native) underlain by native deposits of silt till, clayey silt till, and silty clay. A brief description of the stratigraphy in order of depth follows.

Topsoil

A surficial topsoil layer was encountered in all boreholes. The topsoil thickness varied from about 250 mm to 400 mm thick and comprised dark brown sandy silt with rootlets and organics.

It should be noted that topsoil measurements were carried out at the borehole locations only. A much more detailed analysis (i.e. shallow test pits) is required to accurately quantify the amount of topsoil to be removed for construction purposes. Consequently, topsoil quantities should not be established from the information provided at the borehole locations.

Fill and Possible Reworked Native Soils

Below the topsoil, a fill unit was encountered. This fill unit generally extended to depths of about 0.8 to 1.8 m. In Monitoring Well 4, deep fill was encountered to a depth of about 2.7 m below existing grade. Based on EXP’s site observation, it appears the some of the fill may be reworked native soils from the agricultural operations. The fill generally comprised dark brown to brown sandy silt to clayey silt with trace gravel and occasional organics and rootlets. Locally, in Monitoring Well 4, the fill was dark brown to black with wood pieces. Moisture contents ranged from 14 to 18%, indicating a moist condition.

Silt Till

Below the fill in Boreholes 1, Monitoring Well 1 and 3, a silt till deposit was encountered. The silt till extended to a depth of about 2.1 m below existing grade. The silt till was brown/grey in colour and contained trace sand, clay and gravel. The silt till existed in a compact state of compactness. Moisture contents ranged from 10 to 12%, indicating moist conditions.

Clayey Silt Till

Clayey silt was encountered below the fill or silt till in all boreholes, extending to depths of about 2.9 m to 3.7 m below existing grade. The brown/grey to grey clayey silt deposit contained trace sand and gravel. Based on the pocket penetrometer readings, the clayey silt till was very stiff to hard in consistency. Moisture contents of the moist clayey silt till varied between 11 to 16%.

Silty Clay

A silty clay deposit was encountered below the clayey silt till in all boreholes. The brown/grey to grey clayey silt deposit was stiff to very stiff in consistency. Moisture contents ranged from 14 to 20%, indicating moist to very moist conditions. All boreholes were terminated within the silty clay at depths of about 5.0 to 8.1 m below existing grade.

5.2 Groundwater

Groundwater conditions were observed in the boreholes during the course of the fieldwork and in groundwater monitoring wells installed in all boreholes to establish the stabilized short term groundwater conditions at the site. Short-term groundwater measurements are recorded in the attached borehole logs.

Upon completion of drilling, all boreholes remained dry. The observed groundwater levels and subsequent short-term groundwater level readings are presented in Table 1 below.

Table 1: Short-Term Groundwater Levels in Borehole Locations

Borehole No.	Approximate Ground Surface Elevation (m)	Groundwater Level below Existing Grade upon Completion (m)	Groundwater Level below Existing Grade/Elevation in Groundwater Monitoring Well on June 25, 2021 (m)
BH 1	235.63	Dry	--
BH 2	235.37	Dry	--
BH 3	234.06	Dry	--
BH 4	232.43	Dry	--
BH 5	235.00	Dry	--
BH 6	234.90	Dry	--
MW 1	236.32	Dry	4.32 / ~232.0
MW 2	234.46	Dry	Dry
MW 3	233.84	Dry	3.80 / ~230.0
MW 4	236.34	Dry	Dry
MW 5	233.01	Dry	Dry

The groundwater elevations reflect conditions at the time of the investigation. Seasonal fluctuation of the groundwater levels at the site should be anticipated.

6. Engineering Discussion and Recommendations

6.1 General

A preliminary geotechnical investigation has been conducted for the proposed industrial buildings at the northeast corner of Airport Road and Mayfield Road in the Town of Caledon, Ontario. Based on the latest drawings provided by the client, it is understood that the proposed industrial development will consist of two (2) single storey slab-on-grade structures (Industrial Building 1 and 2) approximately 252,763 and 226,613 square foot in size, respectively. The finished floor elevations (FFE) of Industrial Building 1 and 2 are 235.60 m and 235.50 m, respectively. Initial plans call for a layout parallel with Mayfield Road. Subsequently, the buildings were slightly rotated to be parallel with Airport Road, shifting the buildings.

Based on the results of the limited boreholes drilled at the site, it is considered the site will be suitable for the construction of the proposed industrial buildings.

The following subsections provide preliminary geotechnical engineering guidelines for site development planning. When the design concept plan has been finalized, a more detailed investigation, including additional boreholes, should be undertaken to provide final geotechnical engineering parameters for design and construction of the proposed industrial buildings.

6.2 Site Grading

Based on the FFE of 235.50 to 235.60 m at the site, it is anticipated some cut and fill operations will be required to facilitate construction of the proposed industrial buildings and pavement areas.

The following procedures are recommended for cut and fill operations for proposed pavement areas and building area at the site, where required:

1. Monitoring wells should be properly decommissioned in accordance with MOECC regulations.

2. All existing topsoil, vegetation, topsoil-stained soils, deleterious materials and loose/disturbed soils should be stripped and discarded. Within the proposed building areas, the existing fill (possible reworked native soils) should also be removed and the materials that meets quality and moisture requirements can be re-used and re-compacted.

3. The exposed subgrade surface should be compacted and proof-rolled with a heavy vibratory roller and inspected by geotechnical personnel. Any soft areas detected during the proof-rolling process should be further sub-excavated and replaced with approved on-site or imported materials, compacted to at least 98% standard Proctor

maximum dry density (SPMDD) within the proposed pavement areas. Within the proposed building areas, the material should be compacted to 100% SPMDD.

4. Low areas can then be brought up to final subgrade level with suitable on-site material or approved imported material placed in lifts not exceeding 300 mm thick and compacted to 98% SPMDD in proposed pavement areas and 100% SPMDD in proposed building areas. The moisture content of the fill to be placed should be at or near its optimum moisture content in order to assure the specified densities can be achieved with reasonable compactive effort. All subgrades should be adequately sloped to prevent ponding of rainwater and excessive soaking of fill material.

5. During winter months, it will be difficult to control proper placement and compaction of the fill. Therefore, backfilling operations are not recommended. Frozen material should not be used.

6. Fill slopes should not be steeper than 2 horizontal to 1 vertical and should be protected from surface erosion.

7. All imported borrow fill material from local sources should be free from organic material and foreign objects (i.e. trees, roots, debris, etc.); close to the optimum moisture content and should be tested geotechnically by geotechnical personnel prior to transport to the site. In addition, the chemical quality of the borrow fill material should be assessed in accordance with applicable soil criteria for specific property uses listed in the Ministry of the Environment, Conservation and Parks (MECP) standards.

8. All excavation, backfilling and compaction operations should be monitored on a full-time basis by geotechnical staff to review the materials and to verify the specified degrees of compaction have been obtained with depth and areal extent.

6.3 Foundation Considerations

In view of the FFE of 235.50 to 235.60 m, two (2) foundation schemes are being considered; namely conventional footings on native soil or conventional footings on engineered fill.

6.3.1 Conventional Footings on Native Soil

The proposed structure may be supported on conventional spread and strip footings founded on the competent undisturbed native silt till and clayey silt till below all existing fill and loose soils. It is recommended the footings be placed as high as practical on the native undisturbed soils due to the relatively weaker silty clay lower depths. In general, footings founded on the native compact silt till and very stiff to hard clayey silt till may be designed for a geotechnical resistance of 150 kPa at Serviceability Limit States (S.L.S.), subject to inspection during construction. The factored geotechnical reaction at Ultimate Limit States (U.L.S.) is 225 kPa. Table 2 below provides a summary of the highest founding depth where the recommended geotechnical resistance of 150 kPa (S.L.S.) can be applied for footings.

Table 2: Summary of the Highest Founding Elevations where the Recommended Geotechnical Reaction of 150 kPa (S.L.S.) can be applied for Footings

Proposed Building No.	Borehole No.	Approximate Ground Surface Elevation (m)	Highest Founding Elevation (Depth below ex. Grade) (m)
Industrial Building 1	BH 1	235.63	~234.6 (1.0)
	BH 2	235.37	~234.1 (1.2)
	BH 3	234.06	~233.0 (1.0)
	MW 1	236.32	~235.0 (1.3)
	MW 2	234.46	~232.5 (2.0)
Industrial Building 2	BH 4	232.43	~231.4 (1.0)
	BH 5	235.00	~233.7 (1.3)
	BH 6	234.90	~233.2 (1.7)
	MW 3	233.84	~232.6 (1.2)
	MW 4	236.34	~233.3 (3.0)
	MW 5	233.01	~232.0 (1.0)

Prior to placement of concrete, all footing bases should be inspected by geotechnical personnel from EXP Services Inc. to verify the competency of the founding material.

6.3.2 Conventional Footings on Engineered Fill

As an alternative, the proposed building may also be supported on footings founded on engineered fill developed over the competent native silt till and clayey silt till. Foundations place on the engineered fill can be designed for a geotechnical resistance of 150 kPa at S.L.S. (225 kPa at U.L.S.). It is recommended the engineered fill be constructed to design floor subgrade level prior to installation of footings. This will ensure the engineered fill placed will be suitable for foundations and slab-on-grade construction.

The engineered fill should be constructed by removing all topsoil, topsoil-stained material, fill and upper loose native soils down to the competent native subgrade. The engineered fill should extend as per the drawing shown in Appendix A. The required extent of engineered fill should be determined based on a known fixed location of the structure and adhered to the conditions outlined above. The boundaries of the engineered fill should be laid out by a surveyor in consultation with engineering staff.

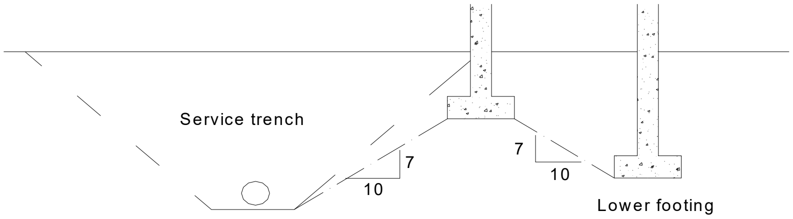
Prior to placement of engineered fill, the exposed subgrade surface should be proof-rolled by a heavy roller and examined by geotechnical personnel. Any soft areas detected during proof-rolling should be removed and replaced with approved material compacted to 100% SPMDD. The area can then be brought up to design subgrade level with suitable on-site material or approved imported material placed in lifts not exceeding 300 mm and compacted to 100% SPMDD.

The engineered fill construction should be monitored on a full-time basis by geotechnical personnel to examine and approve backfill materials, to evaluate placement operations, and to verify the specified degree of compaction is being achieved uniformly throughout the fill. Winter construction is not recommended due to difficulties of controlling the placement of material (i,e, subgrade, etc) and compaction.

It is recommended reinforcing steel be installed in the foundation walls and footings supported on engineered fill or partially on engineered fill and native soils to minimize cracking from differential settlement. The reinforcing steel should be designed by a structural engineer.

6.3.3 Foundations General

Footings which are to be placed at different elevations should be located such that the higher footing is set below a line drawn up at 10 horizontal to 7 vertical from the near edge of the lower footing, as indicated on the following sketch:



FOOTINGS NEAR SERVICE TRENCHES OR AT DIFFERENT ELEVATIONS

All footings exposed to seasonal freezing conditions should be protected from frost action by at least 1.2 m of soil cover or equivalent insulation, depending on the final design requirements.

The total and differential settlements of well designed and constructed footings placed in accordance with the above recommendations are expected to be less than 25 mm and 20 mm, respectively.

It should be noted the recommended bearing value has been calculated by EXP from the borehole information for the design stage only. The investigation and comments are necessarily ongoing as new information on underground conditions becomes available. For example, it should be appreciated modification to bearing levels may be required if unforeseen subsurface conditions are encountered or if final design decisions differ from those assumed in this report. For this reason, this office should be retained to review final foundation drawings and to provide field inspections during the construction stage.

6.4 Excavation and Groundwater Control

For the proposed structures without a basement, it is anticipated that shallow foundation and utilities excavation will be carried out within fill and native silt till and clayey silt till. Excavations within the overburden materials should be relatively straightforward and must be carried out in accordance with the Occupational Health and Safety Act (OHSA) and local regulations. The OHSA regulations require that if workmen must enter an excavation deeper than 1.2 m, the excavation must be suitably sloped and/or shored in accordance with OHSA requirements. OHSA specifies maximum slope of the excavation for the soil types encountered at the site as summarized in the following Table 3:

Table 3: Summary of the Soil Types encountered at the Site

Soil	Soil Type	Maximum Slope
Fill	Type 3*	1 horizontal to 1 vertical
Clayey Silt Till / Silt Till	Type 3*	1 horizontal to 1 vertical

*Note: Where loose soil is encountered or within zones of persistent seepage, it may be necessary to locally flatten the side slopes.

Groundwater seepage into the excavations from perched water within the fill and pervious seams/layers within the native soils should be anticipated during construction. It should be possible to control and remove the minor seepage using conventional construction dewatering techniques, i.e. pumping from sumps.

It should be noted that cobbles and boulders may be present within the tills deposit and as such, provisions should be made in the tender documents to cover any delays caused by cobbles and boulders.

6.5 Backfill Considerations

Backfill used to satisfy underfloor slab requirements, footings and service trenches, etc., should be compactible fill, i.e., inorganic soil with its moisture content close to its optimum value determined in the standard Proctor maximum dry density test. The excavated materials will generally consist of sandy silt to clayey silt fill and native silt till and clayey silt till. Fill that is free of organics and otherwise deleterious materials are considered suitable for reuse as backfill. The native silt till and clayey silt till are also considered suitable for reuse as backfill material. However, portions of these material may require moisture adjustments (i.e. drying) for proper compaction.

Any organic or excessively wet or otherwise deleterious material should not be used for backfilling purposes. Any shortfall of suitable on-site excavated material or backfilling in confined areas can be made up with imported granular material, OPSS Granular 'B' or equivalent. The backfill should be placed in lifts not more than 300 mm thick in the loose state with each lift being compacted to at least 98% standard Proctor maximum dry density (SPMDD) before subsequent lifts are placed. The degree of compaction achieved in the field should be checked by in-place density tests.

The on-site soils are not free draining and therefore should not be used where this characteristic is required or in confined areas where smaller compaction equipment is required. Imported granular material such as OPSS Granular 'B' would also be suitable for these purposes.

6.6 Floor Slab Construction and Permanent Drainage

The floor slab of the proposed structure can be constructed as a slab-on-grade at the site. Prior to slab-on-grade construction, all existing topsoil, loose fill and disturbed native within the floor slab area must be removed. The exposed subgrade surface should be compacted and proof-rolled with a heavy vibratory roller and inspected by geotechnical personnel. Any soft areas identified during the proof-rolling operation should be sub-excavated and replaced with approved material compacted in the manner described in the "Backfill Considerations" subsection of the report.

A moisture barrier, consisting of a 200 mm thick layer of 19 mm clear crushed stone should be placed directly under the floor slab.

Perimeter and underfloor drains are not required if the floor is set at least 150 mm above the exterior grade. Around the perimeter of the building, the ground surface should be sloped on a positive grade away from the structure to promote surface water run-off and to reduce groundwater infiltration adjacent to the foundation.

Within the sidewalk and concrete aprons surrounding the buildings, Styrofoam insulation of minimum 50 mm thick should be provided below the concrete slab to protect against frost heave.

6.7 Earthquake Considerations

The recommendations for the geotechnical aspects to determine the earthquake loading are presented below.

6.7.1 Subsoil Conditions

The subsoil information at this site has been examined in relation to Section 4.1.8.4 of OBC 2012.

The subsoil consisted of sandy silt to clayey silt fill and native silt till and clayey silt till. The proposed structures will be supported on conventional footings founded on the native silt till and clayey silt till or on engineered fill.

There have been no shear wave velocity measurements carried out at this site.

6.7.2 Depth of Boreholes

Table 4.1.8.4.A Site Classification for Seismic Site Response in OBC 2012 indicated that to determine the site classification, the average properties in the top 30 m are to be used. The boreholes were advanced to a depth of about 4.7 to 5.2 m below existing grade. No bedrock was encountered within the depths investigated.

6.7.3 Site Classification

Based on the known soil conditions, the Site Class for this site is “D” as per Table 4.1.8.4.A, Site Classification for Seismic Site Response, OBC 2012.

6.8 Pavement Areas and Access Roads

Detailed traffic data for the proposed development was not available to allow for detailed design of pavement at the time of preparation of this report. The following pavement recommendations for ten (10) year performance period are provided for preliminary purposes, based on EXP’s experience with similar projects. These recommendations can be refined and twenty (20) year performance designs provided once detailed traffic data becomes available. The recommendations are based on the limited boreholes advanced at this site. If fine tuning are required, additional boreholes should be advanced in the pavement areas.

It is anticipated that the pavement construction at the site will be classified as light-duty where car traffic only is expected and heavy-duty along truck parking and access roads.

In general, the pavement subgrade is expected to comprise native silt till, clayey silt till and localized compacted engineered fill. The recommended pavement structures provided in the sub-sections below are based upon an estimate of the subgrade soil properties determined from visual examination and textural classification of the soil samples, and laboratory testing of the subgrade soil. The subgrade soils are classified as frost susceptible. A functional design life of ten (10) years has been used to establish the pavement recommendations. This represents the number of years to the first rehabilitation, assuming regular maintenance is carried out.

For this project, the use of heavy-duty flexible pavement with aggregate base is recommended for the main access roads and trailer storage/parking areas. Rigid concrete pavement is recommended in areas where truck turning is anticipated. Full depth asphaltic concrete pavements are not used in Ontario due to freeze/thaw conditions experienced over annual seasons.

Based on the afore mentioned information and assumptions, the various pavement designs are categorized as follows:

Flexible Pavements

- Light Duty Pavement (light vehicle parking, i.e. passenger cars, vans, pickup trucks, etc.)
- Heavy Duty Flexible Pavement (main access roads and parking/storage pavement for loaded tractor trailers, entrances, and driveways)

Rigid Pavements

- Rigid Pavement - Loading Docks (tractor trailer)
- Heavy Duty Rigid Concrete Pavement (truck turning areas)
- Concrete Dolly Pads (within tractor trailer parking/storage area)

6.8.1 Flexible Pavement Structures

The design parameters were assumed based on our experience in similar design applications utilizing the method from the Adaptation and Verification of AASHTO pavement design guide for Ontario conditions, prepared by ERES Consultants for the Ministry of Transportation of Ontario. The following parameters were used in the Darwin pavement design software for the analysis:

- Performance Period (Years) - 10 years
- Percent Heavy Trucks - 100%
- Average Daily Traffic - up to 500 Vehicles/day (Heavy Duty)
- Average Initial Truck Factor - 1.8 ESALs/Truck
- Annual Growth Rate - 15%
- Subgrade Resilient Modulus - 40 MPa

Based on the above traffic parameters, the total ESALs (equivalent single axle loadings) over the 10 year analysis period would be approximately 2.76 million ESALs for the heavy-duty pavement.

The recommended pavement structures for the various areas are summarized in Table 4 below.

Table 4: Recommended Pavement Structure Thicknesses (Flexible)

Pavement Layer	Compaction Requirements	Light-Duty Pavement Areas	Heavy-Duty Pavement Areas
Asphaltic Concrete (OPSS 310/1150)	Minimum 91.5% MRD for HL8/HDBC [1,3] Minimum 92.0% MRD for HL3-HS/HL3 [3]	40 mm HL3 50 mm HL8	40 mm HL3 (High Stability) 80 mm HDBC[3]
19 mm Crusher-run Limestone (OPSS 1010)	100% SPMDD [2]	150 mm	150 mm
50 mm Crusher-run Limestone (OPSS 1010)	100% SPMDD [2]	200 mm	500 mm

Notes:
1. Denotes maximum relative density, MTO LS-264
2. Denotes standard Proctor maximum dry density, MTO LS-706 (Procedure 3)
3. Denotes Heavy Duty Binder Course (HDBC), OPSS 1150

6.8.2 Rigid Pavement Structures

Three types of rigid pavements are recommended in this project for the various applications as follows:

1. Heavy Duty Rigid Pavement (main entrance(s), maintenance areas, turning nodes)
2. Concrete pads adjacent to loading docks
3. Concrete dolly pads along trailer parking areas.

The thickness and material selection of these pavement structures are summarized in Table 6:

Table 5: Recommended Pavement Structure Thicknesses (Rigid)

Pavement Layer	Compaction Requirements	Main Entrance(s) (including maintenance areas)	Concrete Pads Adjacent to Loading Docks	Concrete Dolly Pads
Concrete CSA Class C-2 32 MPa	-	250 mm	230 mm	200 mm [4]
19 mm Crusher-run Limestone (OPSS 1010)	100% SPMDD [2]	200 mm	200 mm	70 mm
50 mm Crusher-run Limestone (OPSS 1010)	100% SPMDD [2]	-	-	500 mm

Notes:
(2) Denotes standard Proctor maximum dry density, MTO LS-706 (Procedure 3)
(4) The concrete dolly pads should be 200mm thick with shrinkage steel.

The concrete for this project should be C-2 Class as a minimum, i.e., 32 MPa, 0.45 maximum water/cement ratio. The nominal aggregate size in the mix should be 37.5 mm and the air content should range from 4 to 7%.

6.8.3 Pavement Structure Transition Zones

To minimize differential settlement and heaving, a 10 horizontal to 1 vertical longitudinal transition should be used at the bottom of the various pavement layers for abutting pavement structures with different pavement thickness designs.

6.8.4 Subsurface Drainage System

It should be noted that pavement subsurface drainage systems can increase the life of pavements by removing water that is detrimental to the performance of pavement structures. It is recommended the system be constructed in a 300 mm wide by 300 mm deep trench with 100 mm diameter perforated drainage pipe surrounded by 19 mm clear crushed stone wrapped in filter cloth. In general, the subdrains should be installed at the following locations:

1. Behind the concrete curbs where there would be a berm or higher grading is anticipated on the other side of the pavement structure; and
2. Subdrains being extended from the catch basins for a minimum of ten (10) metres to provide better drainage to the granular layers of the surrounding pavement.

6.8.5 Rigid and Flexible Pavement Joint Sealant

We recommend the joints between the rigid and flexible pavements be sealed with a polymer modified bitumen strip to prevent the ingress of water, dirt, vegetation and other particles that would compromise the performance of the pavements.

Based on our practical experience on other projects, Densoband should be installed between the rigid and flexible pavements to withstand the different rates of expansion. Densoband (8 mm thick x 45mm width) should be installed flush with the concrete surface on the vertical face at the edge of the concrete, prior to paving. The product requires a specialized primer (Densoband Primer) that is available from the manufacturer, coupled with hot applied procedure being done manually or by machine. The product would form a flexible seal between the two pavements after paving of the hot mix asphalt layers. Maintenance of this sealant would be required on an as-needed basis.

6.8.6 Sawn and Construction Joints

Sawcut joints are installed to control shrinkage cracking within the concrete. Sawcut control joints should be sawn at a maximum spacing of approximately 4.5 m. In general, cutting of joints should take place after the concrete has gained enough strength to not ravel the joint edges during sawing. The concrete should not be cut too late as internal stresses may cause random cracking to occur before sawing is started or during the actual sawing operations. Saw cut joints do not require sealing. If a curing compound is used to cure the concrete surface, the faces of sawn control joints should also receive an application of curing compound after sawing. The depths of these sawn control joints are explained in the following sub-sections for each of the concrete pavements.

Loading Dock Concrete

The concrete strip around the loading docks extending the full length of the longest trailer is anticipated to be used on site, typically 18.3 m (60 ft.) from the building wall. The joints perpendicular to the building should be spaced at approximately 4 m to match the door spacing. The joints parallel to the building wall should be spaced at approximately 4.5 m which will require 3 cuts in this direction. Any steel reinforcement required in the loading dock concrete should be designed by the structural engineer of record. The depth of the sawn joints should be at least 25% of the slab thickness, anticipated to be about 60mm.

Dolly Pad Concrete Strips

The anticipated width for the dolly pads is 0.91 m wide. Shrinkage included in the strips will provide some load transfer and some crack control will be required in these narrow strips. The sawcut joints should be spaced at 2 m to allow most of the shrinkage cracking to occur in the joints. It is anticipated that some panel cracking will occur outside the sawn joints due to the thin ribbon of reinforced concrete normally proposed. The depth of sawn joints in this reinforced concrete should be at least 33% of the slab thickness, in this case ~66 mm.

Main Entrance(s), Maintenance Areas and Truck Turning Areas

This area includes the inbound and outbound truck lanes where channelized traffic will occur. The actual inbound and outbound lanes, including the emergency lane will be full width with transverse sawcuts at 4.5 m. The jointing details in the general concrete paved areas within the site should be reviewed in detail, not to include any small sections of concrete or sharp corners after sawcutting. The minimum dimension between sawcuts should be 3.0 m. Sawn joints should be cut to a depth of 25% of the slab thickness, anticipated to be about 60 mm. Where channelized traffic of loaded trucks passes over a concrete/asphalt transition, it is recommended that the edge of concrete be thickened by 20% which would require a deeper sawn joint in those areas to meet the 25% sawn joint depth.

Construction Joints

Construction joints are required at the end of the day concrete placement, which consist of dowels for load transfer. The dowels should be 25 mm in diameter, 600mm in length spaced at 450 mm, and placed at the mid-depth of the slab.

6.8.7 Construction Notes

The foregoing designs assume construction is carried out during dry periods and the subgrade is stable under the load of construction equipment. If construction is carried out during wet weather and heaving or rolling of the subgrade is experienced, additional thickness of subbase course material may be required.

The long-term performance of the pavement structures is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure uniform subgrade moisture and density conditions are achieved. In addition, the need for adequate drainage cannot be over-emphasized. The finished pavement surface and underlying subgrade should be free of depressions and should be sloped to provide effective surface drainage toward catchbasins. Surface water should not be allowed to pond adjacent to the outside edges of pavement areas, subgrade and/or pavements.

Additional comments on the construction of parking areas, driveways and shipping/receiving areas are as follows:

1. Proposed parking areas, driveways and shipping/receiving areas should be stripped of vegetation, fill, topsoil and topsoil-stained and soft subgrade material. The exposed subgrade should be proofrolled in the presence of a representative of this office. Soft or spongy subgrade areas should be subexcavated and replaced with suitable approved backfill compacted to 100% SPMDD. Fill required to raise the grades to design elevations should be organic-free and at a moisture content which will permit compaction to 100% SPMDD. The final subgrade surface should be properly shaped and crowned.

2. To minimize problems of differential movement between the pavement and catchbasins/manholes due to frost action, backfill around these structures should consist of free-draining granular material. The granular material should be compacted to 100% SPMDD with a smaller tamper to avoid damaging the structures.

3. The most severe loading conditions on light-duty pavement areas and the subgrade may occur during construction. Consequently, special provisions such as restricted lanes, half-loads during paving, etc. may be required, especially if construction is carried out during unfavorable weather or during Spring thaw.

7. General Comments

A geotechnical engineer should be retained for a general review of the final design and specifications to verify the recommendations in this report address all relevant geotechnical parameters regarding the design and construction of the proposed development.

The comments given in this report are intended only for the guidance of design and structural engineers. The number of boreholes required to determine the localized underground conditions between boreholes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. could be greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations as well as their own interpretations of the factual borehole results so that they may draw their own conclusions as to how the subsurface conditions may affect them.

More specific information with respect to the conditions between samples or the lateral and vertical extent of materials may become apparent during excavation operations. The interpretation of the borehole information must, therefore, be validated during excavation operations. Consequently, during the future development of the property, conditions not observed during this investigation may become apparent; should this occur, a geotechnical engineer should be contacted to assess the situation and additional testing and reporting may be required. EXP has qualified personnel to provide assistance in regard to future geotechnical issues related to this property.

We trust this report is satisfactory for your purposes. Should you have any questions or comments, please do not hesitate to contact this office.

Yours truly,
EXP Services Inc.

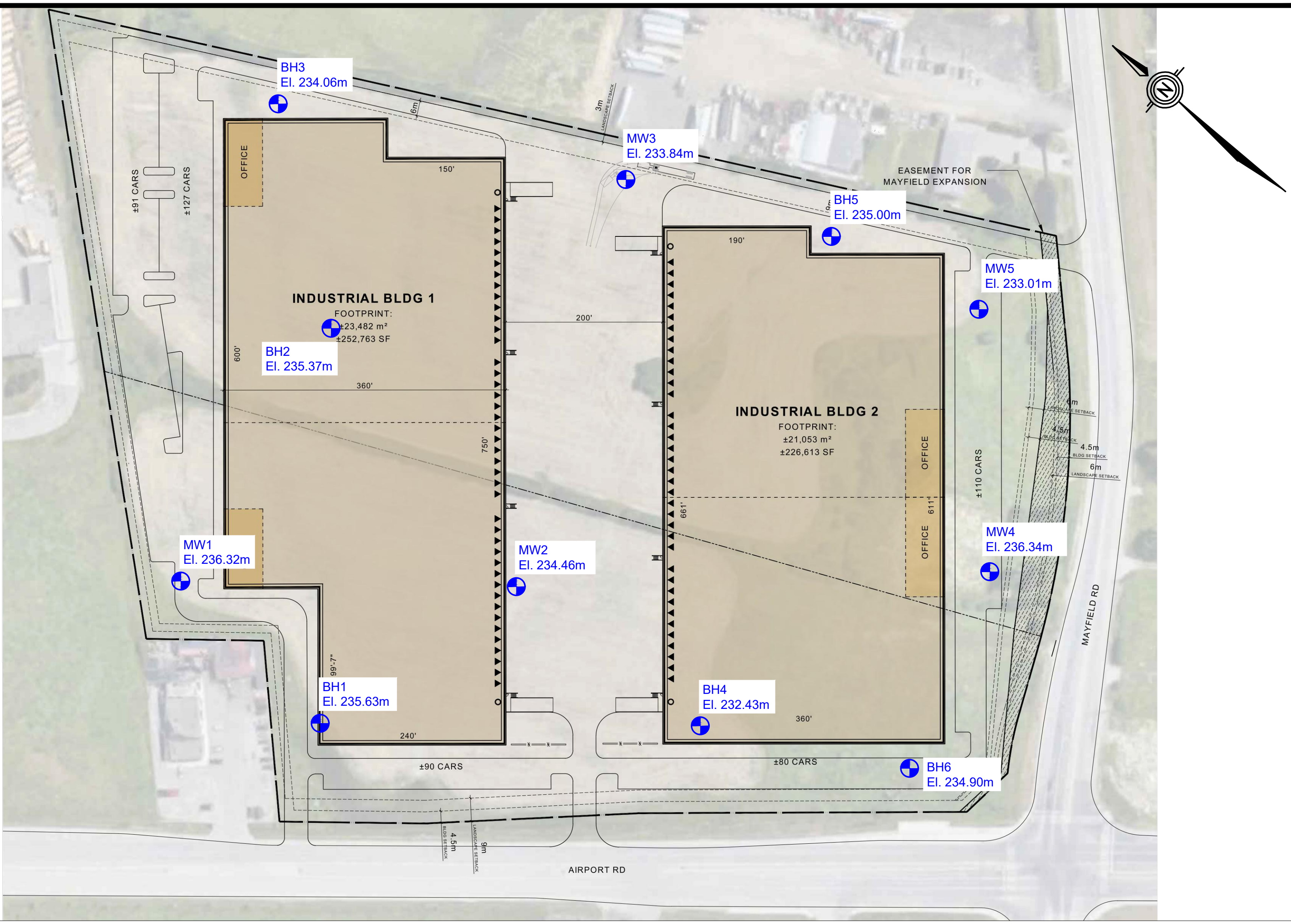
LICENSED PROFESSIONAL ENGINEER
L. C. C. CHUI
100156747
PROVINCE OF ONTARIO

Leo Chui, P. Eng.
Project Manager
Geotechnical Services

For Stephen S. M. Cheng, P. Eng.
Discipline Manager
Geotechnical Division

Drawings

Borehole Location Plan
Borehole Logs



NOTES:

1. THE BOUNDARIES AND SOIL TYPES HAVE BEEN ESTABLISHED ONLY AT BOREHOLE LOCATIONS. BETWEEN BOREHOLES THEY ARE ASSUMED AND MAY BE SUBJECT TO CONSIDERABLE ERROR
2. SOIL SAMPLES WILL BE RETAINED IN STORAGE FOR 1 MONTH AND THEN DESTROYED UNLESS CLIENT ADVISES THAT AN EXTENDED TIME PERIOD IS REQUIRED.
3. THIS DRAWING WAS REPRODUCED FROM A SITE PLAN PROVIDED FROM THE CLIENT.
4. BOREHOLE ELEVATIONS SHOULD NOT BE USED FOR BUILDING OR PARKING LOT GRADES.

LEGEND:

⊕ BOREHOLE LOCATION

EXP Services Inc.
t: +1.905.695.3217 | f: +1.905.695.0169
220 COMMERCE VALLEY DR., SUITE 110
MARKHAM, ON L3T 0A8
Canada

www.exp.com

The new identity of Trow

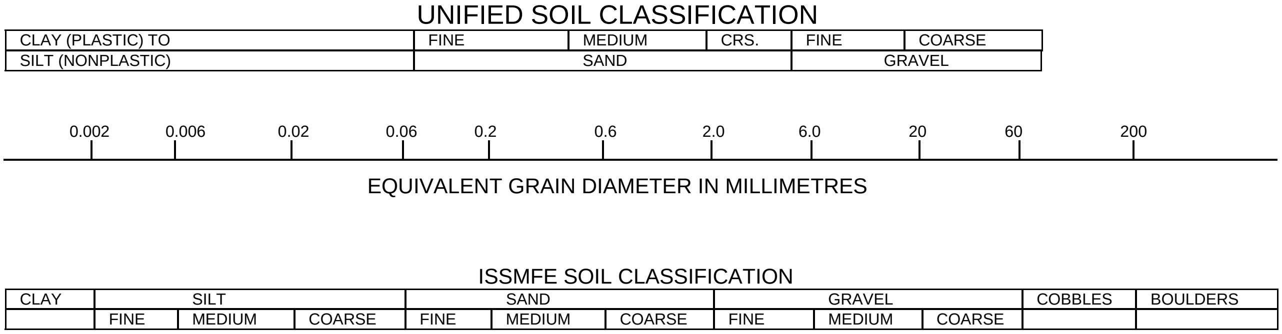
PROJECT TITLE AND LOCATION:
PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED INDUSTRIAL DEVELOPMENT
AIRPORT ROAD AND MAYFIELD ROAD
CALEDON, ONTARIO

DRAWING TITLE:
BOREHOLE LOCATION PLAN

PROJECT#: GTR-0800029-D0
SCALE: 1:2250
DATE: JULY 2021
DWN.: LC
CHKD.: SC
DWG. No.: 1

Notes on Sample Descriptions

1. All sample descriptions included in this report follow the International Society for Soil Mechanics and Foundation Engineering (ISSMFE), as outlined in the Canadian Foundation Engineering Manual. Note, however, that behavioral properties (i.e. plasticity, permeability) take precedence over particle gradation when classifying soil. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.



2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (75 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Notes On Soil Descriptions

4. The following table gives a description of the soil based on particle sizes. With the exception of those samples where grain size analyses have been performed, all samples are classified visually. The accuracy of visual examination is not sufficient to differentiate between this classification system or exact grain size.

Soil Classification		Terminology	Proportion
Clay and Silt	<0.060 mm	"trace" (e.g. Trace sand)	1% to 10%
Sand	0.060 to 2.0 mm	"some" (e.g. Some sand)	10% to 20%
Gravel	2.0 to 75 mm	adjective (e.g. sandy, silty)	20% to 35%
Cobbles	75 to 200 mm	"and" (e.g. and sand)	35% to 50%
Boulders	>200 mm		

The compactness of Cohesionless soils and the consistency of the cohesive soils are defined by the following:

Cohesionless Soil		Cohesive Soil		
Compactness	**Standard Penetration Resistance "N" Blows / 0.3 m**	**Consistency**	**Undrained Shear Strength (kPa)**	**Standard Penetration Resistance "N" Blows / 0.3 m**
Very Loose	0 to 4	Very soft	<12	<2
Loose	4 to 10	Soft	12 to 25	2 to 4
Compact	10 to 30	Firm	25 to 50	4 to 8
Dense	30 to 50	Stiff	50 to 100	8 to 15
Very Dense	Over 50	Very Stiff	100 to 200	15 to 30
		Hard	>200	>30

5. **ROCK CORING**

Where rock drilling was carried out, the term RQD (Rock Quality Designation) is used. The RQD is an indirect measure of the number of fractures and soundless of the rock mass. It is obtained from the rock cores by summing the length of the core covered, counting only those pieces of sound core that are 100 mm or more length. The RQD value is expressed as a percentage and is the ratio of the summed core lengths to the total length of core run. The classification based on the RQD value is given below.

RQD Classification	RQD (%)
Very Poor Quality	<25
Poor Quality	25 to 50
Fair Quality	50 to 75
Good Quality	75 to 90
Excellent Quality	90 to 100

$$\text{Recovery Designation \% Recovery} = \frac{\text{Length of Core Per Run}}{\text{Total Length of Run}} \times 100$$

Log of Borehole BH1

Project No. GTR-00800029-D0

Project: Proposed Industrial Development

Location: Airport Road and Mayfield Road, Caledon, Ontario

Drawing No. 2

Sheet No. 1 of 1

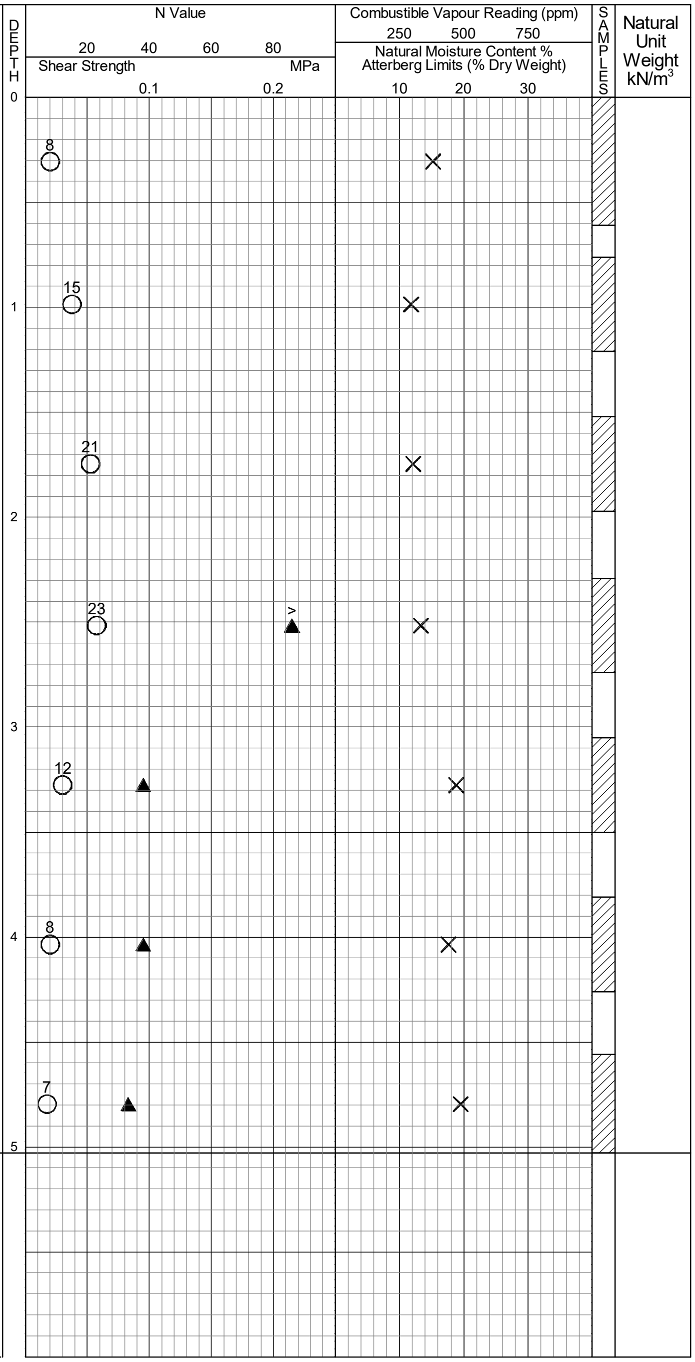
Date Drilled: June 24, 2021

Drill Type: CME75 Track Mount

Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	×
Dynamic Cone Test	—	Plastic and Liquid Limit	├—○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m
			235.63
		TOPSOIL - approximately 280 mm thick - sandy silt with rootlets and organics; dark brown, moist	
		FILL (POSSIBLE REWORKED NATIVE) - sandy silt to clayey silt, trace gravel, trace rootlets; dark brown to brown, moist	235.4
		SILT TILL - trace sand, trace clay, trace gravel; brown/grey, moist, compact	234.8
		CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, very stiff	233.5
		SILTY CLAY - grey, moist to very moist, stiff	232.7
		END OF BOREHOLE	230.6



Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Open

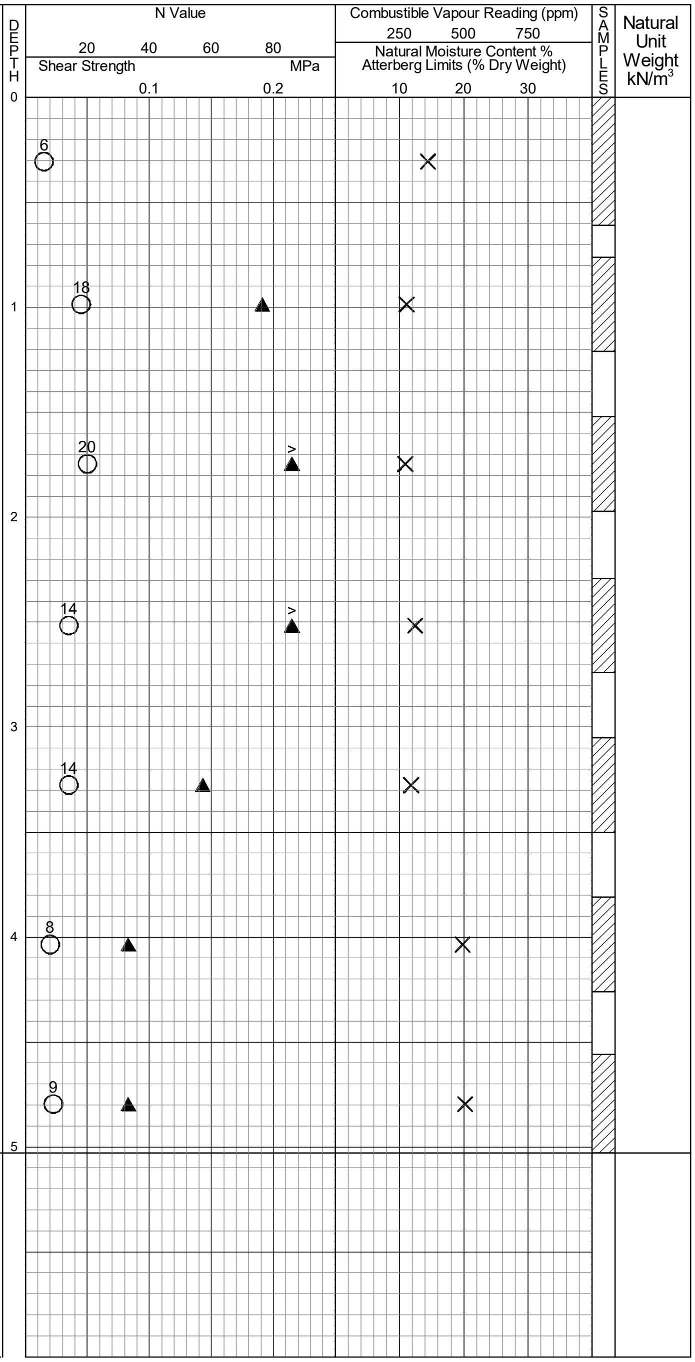
Log of Borehole BH2

Project No. GTR-00800029-D0
Drawing No. 3
Project: Proposed Industrial Development
Sheet No. 1 of 1
Location: Airport Road and Mayfield Road, Caledon, Ontario

Date Drilled: June 24, 2021
Drill Type: CME75 Track Mount
Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	×
Dynamic Cone Test	—	Plastic and Liquid Limit	├—○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m
			235.37
		TOPSOIL - approximately 330 mm thick - sandy silt with rootlets and organics; dark brown, moist	
			235.0
		FILL (POSSIBLE REWORKED NATIVE) - sandy silt, trace gravel, trace rootlets; dark brown to brown, moist	
			234.4
		CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, stiff to very stiff	
			231.7
		SILTY CLAY - grey, moist to very moist, stiff	
			230.3
		END OF BOREHOLE	



Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Open

Log of Borehole BH3

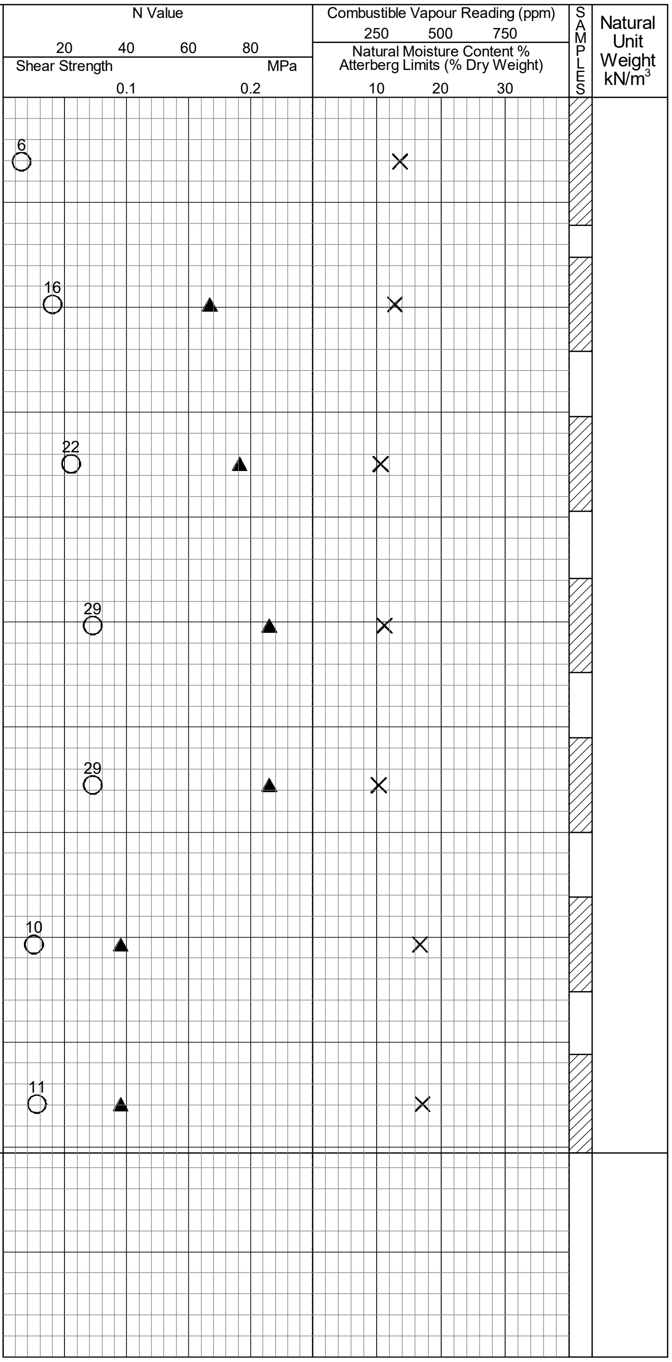
Project No. GTR-00800029-D0
Project: Proposed Industrial Development
Location: Airport Road and Mayfield Road, Caledon, Ontario

Drawing No. 4
Sheet No. 1 of 1

Date Drilled: June 24, 2021
Drill Type: CME75 Track Mount
Datum: Geodetic

Auger Sample	☒
SPT (N) Value	○ ▨
Dynamic Cone Test	—
Shelby Tube	■
Field Vane Test	✚ S
Combustible Vapour Reading	☐
Natural Moisture	×
Plastic and Liquid Limit	⊢—○
Undrained Triaxial at % Strain at Failure	⊕
Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
			234.06	0
		TOPSOIL - approximately 300 mm thick - sandy silt with rootlets and organics; dark brown, moist		
			233.8	
		FILL (POSSIBLE REWORKED NATIVE) - sandy silt to clayey silt, trace gravel, trace rootlets; dark brown to brown, moist		
			233.2	
		CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, very stiff		1
				2
				3
			230.4	
		SILTY CLAY - grey, moist to very moist, stiff		4
			229.0	5
		END OF BOREHOLE		



LAGWGL02 GTR-00800029-D0 - AIRPORT ROAD AND MAYFIELD.GPJ NEW.GDT 7/19/21

Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Open

Log of Borehole BH4

Project No. GTR-00800029-D0

Drawing No. 5

Project: Proposed Industrial Development

Sheet No. 1 of 1

Location: Airport Road and Mayfield Road, Caledon, Ontario

Date Drilled: June 24, 2021

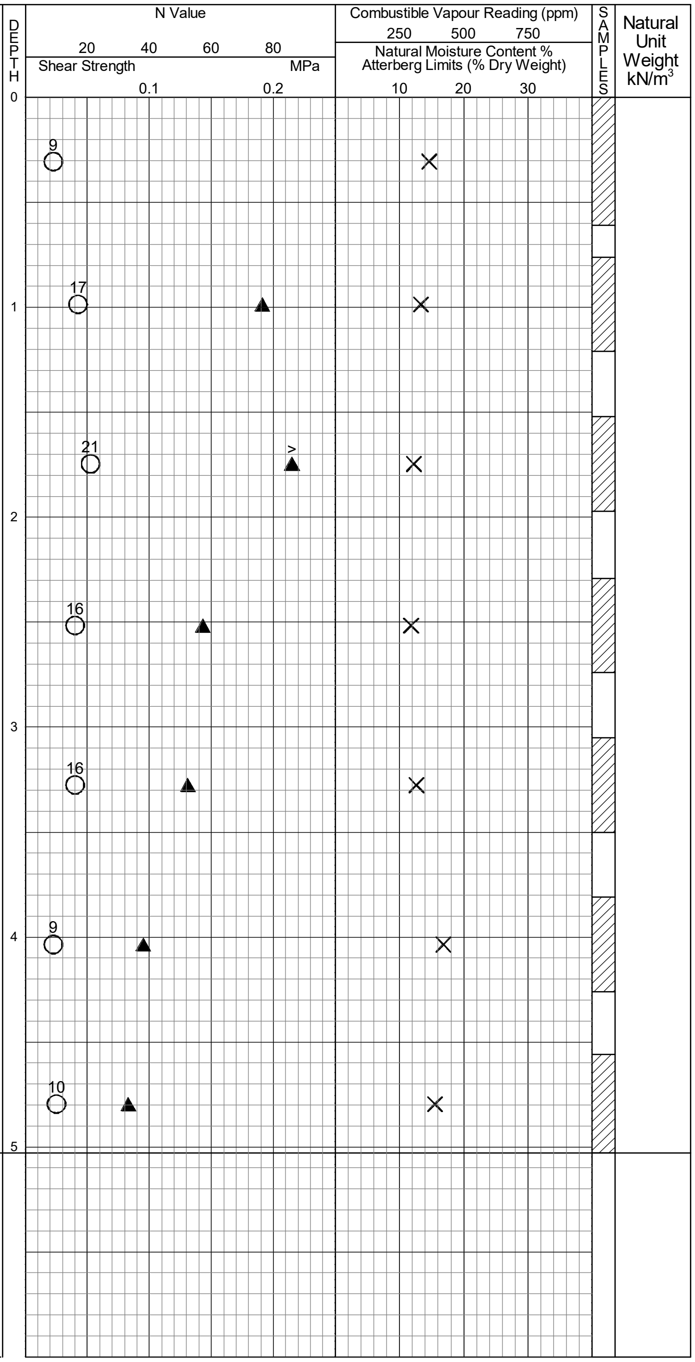
Drill Type: CME75 Track Mount

Datum: Geodetic

Auger Sample	☒
SPT (N) Value	○ ▨
Dynamic Cone Test	—
Shelby Tube	■
Field Vane Test	✚ S

Combustible Vapour Reading	☐
Natural Moisture	×
Plastic and Liquid Limit	├──○
Undrained Triaxial at % Strain at Failure	⊕
Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m
			232.43
		TOPSOIL - approximately 380 mm thick - sandy silt with rootlets and organics; dark brown, moist	232.1
		FILL (POSSIBLE REWORKED NATIVE) - sandy silt, trace gravel, trace rootlets; dark brown to brown, moist	231.5
		CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, very stiff	228.7
		SILTY CLAY - grey, very moist, stiff	227.4
		END OF BOREHOLE	



LAGWGL02 GTR-00800029-D0 - AIRPORT ROAD AND MAYFIELD.GPJ NEW.GDT 7/19/21

Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Open

Log of Borehole BH5

Project No. GTR-00800029-D0

Drawing No. 6

Project: Proposed Industrial Development

Sheet No. 1 of 1

Location: Airport Road and Mayfield Road, Caledon, Ontario

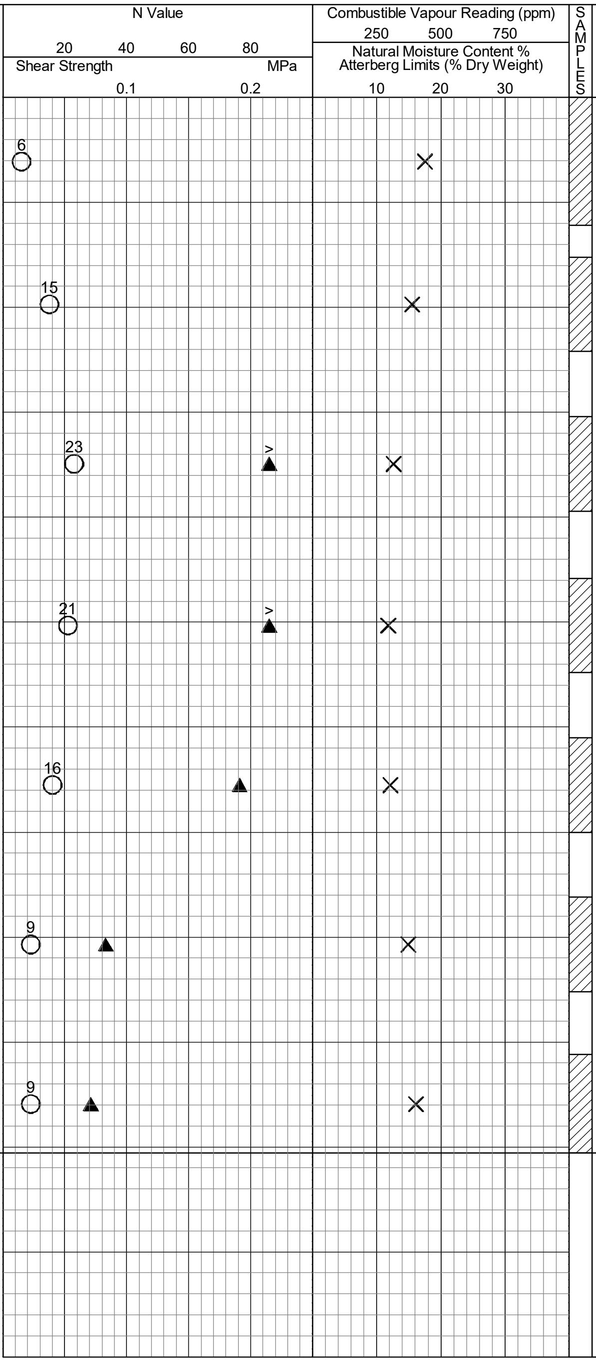
Date Drilled: June 25, 2021

Drill Type: CME75 Track Mount

Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	×
Dynamic Cone Test	—	Plastic and Liquid Limit	⊢—○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
			235.00	0
		TOPSOIL - approximately 310 mm thick - sandy silt with rootlets and organics; dark brown, moist		
			234.7	
		FILL (POSSIBLE REWORKED NATIVE) - sandy silt, trace gravel, trace rootlets; dark brown to brown, moist		
			233.9	1
		CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, very stiff		2 3
			231.5	
		SILTY CLAY - grey, moist to very moist, stiff		4
			230.0	5
		END OF BOREHOLE		



Natural Unit Weight kN/m³

LAGWGL02 GTR-00800029-D0 - AIRPORT ROAD AND MAYFIELD ROAD.GPJ NEW.GDT 7/19/21

Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Open

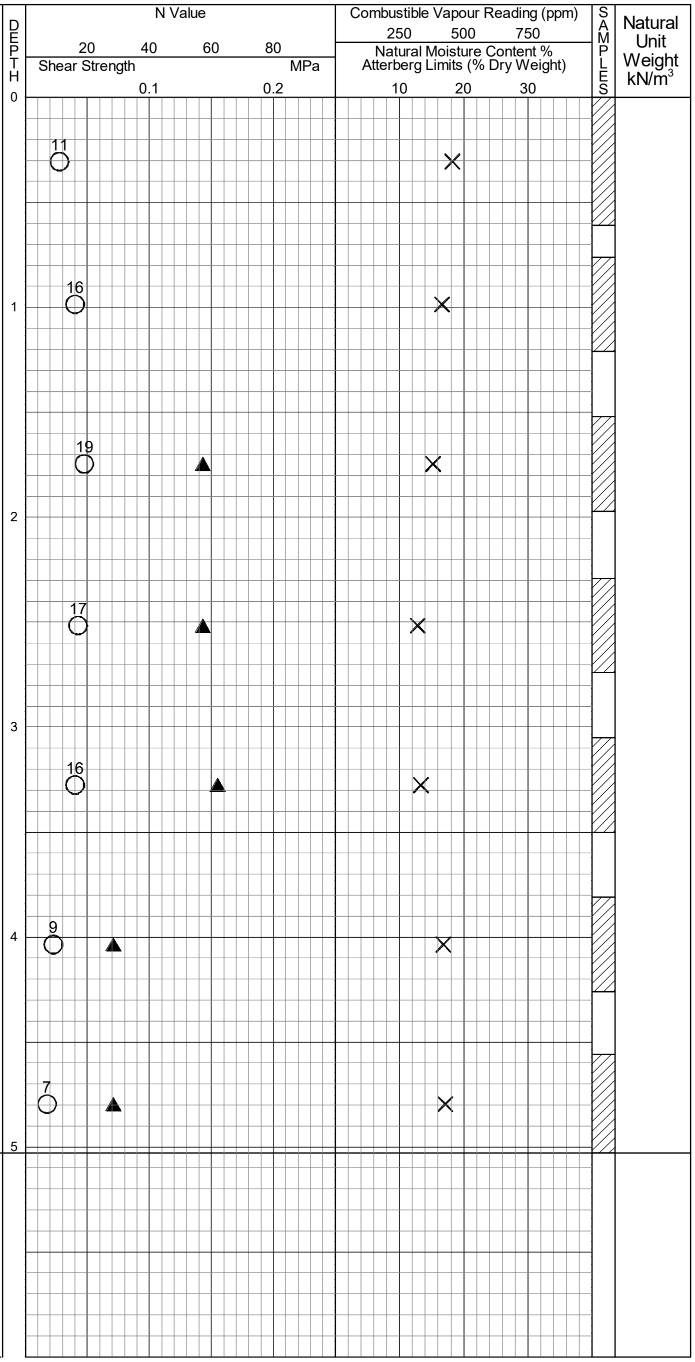
Log of Borehole BH6

Project No. GTR-00800029-D0
Drawing No. 7
Project: Proposed Industrial Development
Sheet No. 1 of 1
Location: Airport Road and Mayfield Road, Caledon, Ontario

Date Drilled: June 24, 2021
Drill Type: CME75 Track Mount
Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	×
Dynamic Cone Test	—	Plastic and Liquid Limit	⊢—○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m
			234.90
		TOPSOIL - approximately 320 mm thick - sandy silt with rootlets and organics; dark brown, moist	234.6
		FILL (POSSIBLE REWORKED NATIVE) - sandy silt to clayey silt, trace gravel, trace rootlets; dark brown to brown, moist	233.5
		CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, very stiff	231.2
		SILTY CLAY - grey, very moist, firm to stiff	229.9
		END OF BOREHOLE	



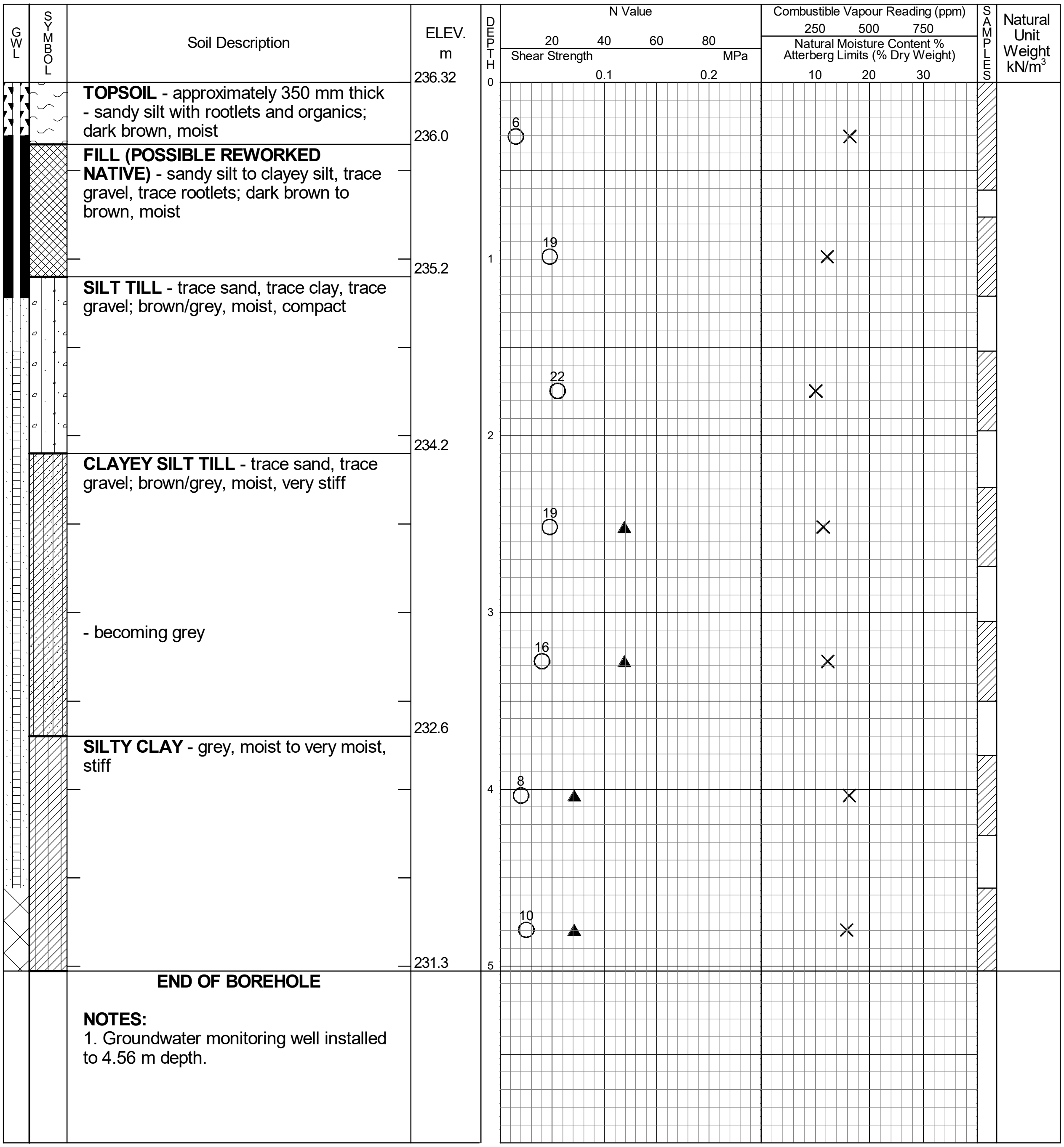
Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Open

Log of Borehole MW1

Project No. GTR-00800029-D0
Drawing No. 8
Project: Proposed Industrial Development
Sheet No. 1 of 1
Location: Airport Road and Mayfield Road, Caledon, Ontario

Date Drilled: June 24, 2021
Drill Type: CME75 Track Mount
Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	×
Dynamic Cone Test	—	Plastic and Liquid Limit	├─○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲



236.32

TOPSOIL - approximately 350 mm thick - sandy silt with rootlets and organics; dark brown, moist

236.0

FILL (POSSIBLE REWORKED NATIVE) - sandy silt to clayey silt, trace gravel, trace rootlets; dark brown to brown, moist

235.2

SILT TILL - trace sand, trace clay, trace gravel; brown/grey, moist, compact

234.2

CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, very stiff

- becoming grey

232.6

SILTY CLAY - grey, moist to very moist, stiff

231.3

END OF BOREHOLE

NOTES:
1. Groundwater monitoring well installed to 4.56 m depth.

LAGWGL02 GTR-00800029-D0 - AIRPORT ROAD AND MAYFIELD.GPJ NEW.GDT 7/19/21

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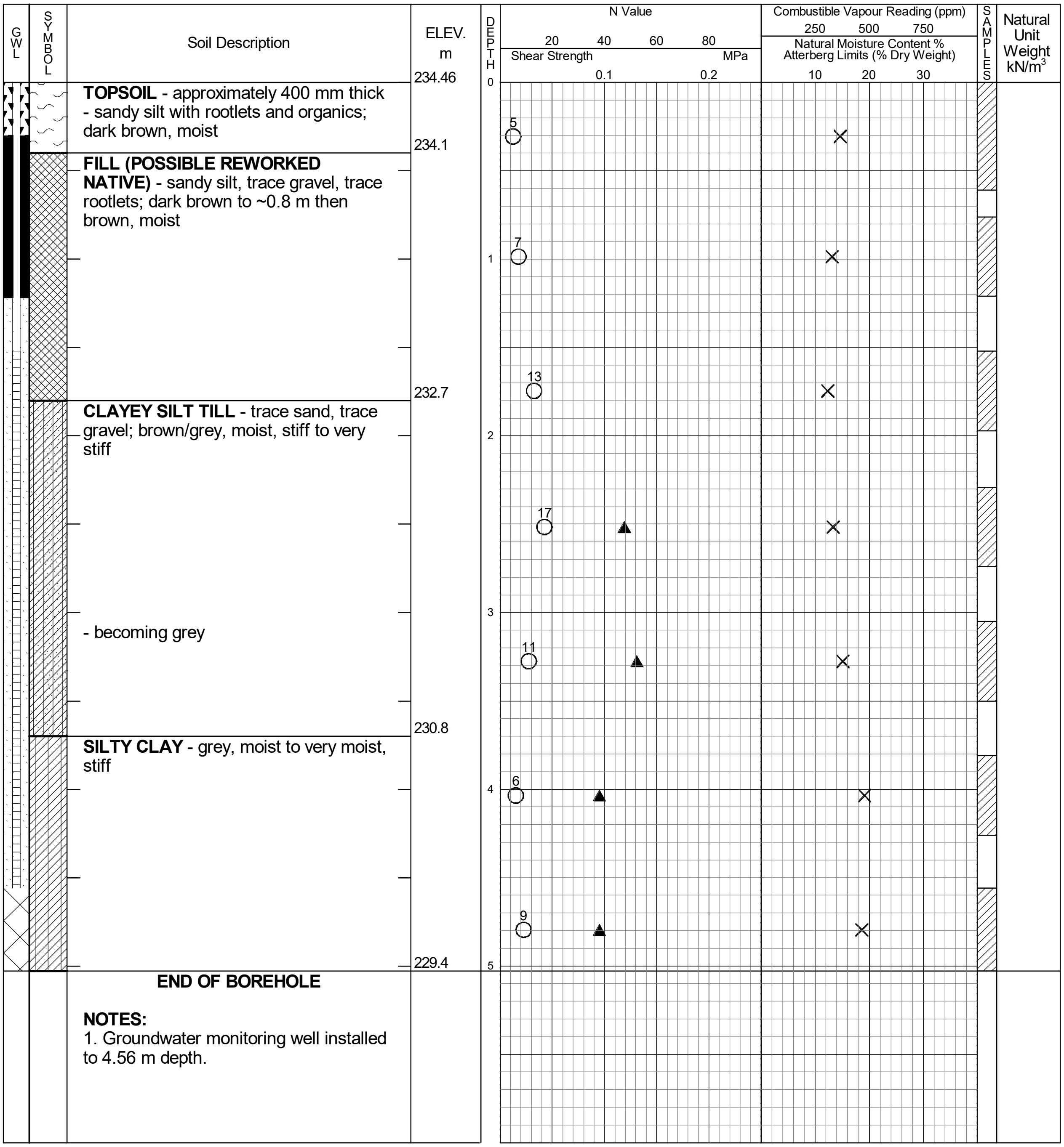
Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Well
June 30, 2021	4.32	Well

Log of Borehole MW2

Project No. GTR-00800029-D0
Drawing No. 9
Project: Proposed Industrial Development
Sheet No. 1 of 1
Location: Airport Road and Mayfield Road, Caledon, Ontario

Date Drilled: June 24, 2021
Drill Type: CME75 Track Mount
Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test —
Shelby Tube ■
Field Vane Test ✚ S
Combustible Vapour Reading ☐
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲



ELEV. m	Soil Description
234.46	**TOPSOIL** - approximately 400 mm thick - sandy silt with rootlets and organics; dark brown, moist
234.1	**FILL (POSSIBLE REWORKED NATIVE)** - sandy silt, trace gravel, trace rootlets; dark brown to ~0.8 m then brown, moist
232.7	**CLAYEY SILT TILL** - trace sand, trace gravel; brown/grey, moist, stiff to very stiff - becoming grey
230.8	**SILTY CLAY** - grey, moist to very moist, stiff
229.4	**END OF BOREHOLE**

NOTES:
1. Groundwater monitoring well installed to 4.56 m depth.

Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Well
June 30, 2021	Dry	Well

Log of Borehole MW3

Project No. GTR-00800029-D0

Drawing No. 10

Project: Proposed Industrial Development

Sheet No. 1 of 1

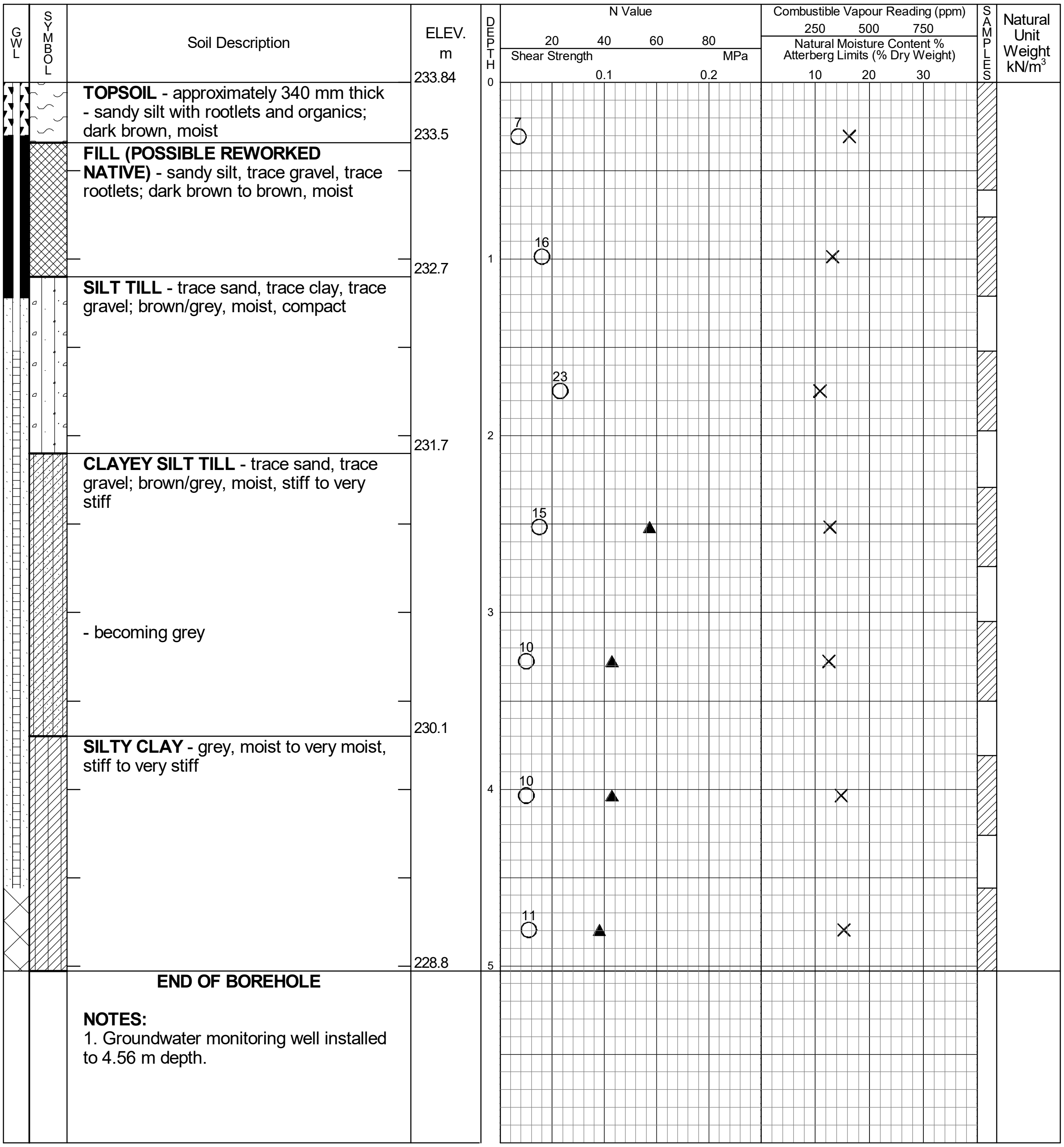
Location: Airport Road and Mayfield Road, Caledon, Ontario

Date Drilled: June 24, 2021

Drill Type: CME75 Track Mount

Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	×
Dynamic Cone Test	—	Plastic and Liquid Limit	├──○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲



Soil Description	ELEV. m
	233.84
TOPSOIL - approximately 340 mm thick - sandy silt with rootlets and organics; dark brown, moist	233.5
FILL (POSSIBLE REWORKED NATIVE) - sandy silt, trace gravel, trace rootlets; dark brown to brown, moist	232.7
SILT TILL - trace sand, trace clay, trace gravel; brown/grey, moist, compact	231.7
CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, stiff to very stiff - becoming grey	230.1
SILTY CLAY - grey, moist to very moist, stiff to very stiff	228.8

END OF BOREHOLE

NOTES:

1. Groundwater monitoring well installed to 4.56 m depth.

LAGWGL02 GTR-00800029-D0 - AIRPORT ROAD AND MAYFIELD.GPJ NEW.GDT 7/19/21

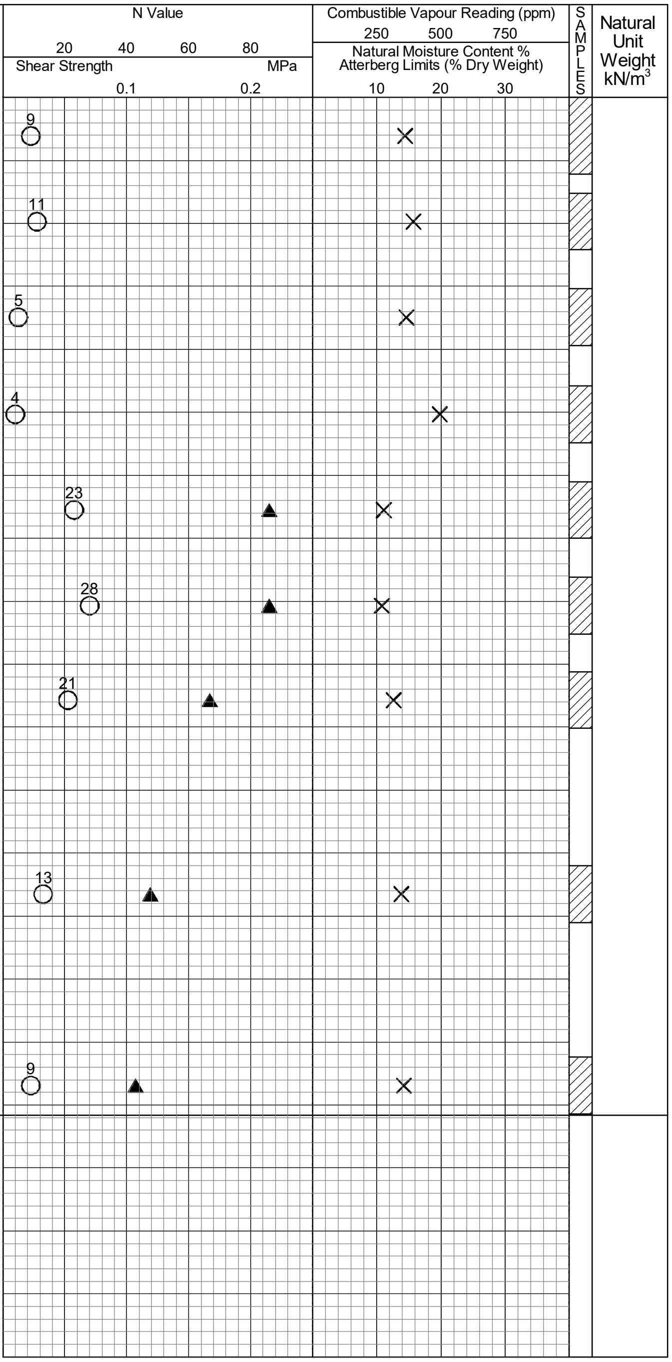
Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Well
June 30, 2021	3.80	Well

Log of Borehole MW4

Project No.	GTR-00800029-D0	Drawing No.	11
Project:	Proposed Industrial Development	Sheet No.	1 of 1
Location:	Airport Road and Mayfield Road, Caledon, Ontario		
Date Drilled:	June 25, 2021		
Drill Type:	CME75 Track Mount		
Datum:	Geodetic		

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	×
Dynamic Cone Test	—	Plastic and Liquid Limit	⊢—○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲

Soil Description	ELEV. m	DEPTH (m)
	236.34	0
TOPSOIL - approximately 250 mm thick - sandy silt with rootlets and organics; dark brown, moist	236.1	
FILL - sandy silt, trace gravel, trace rootlets; dark brown/black to brown, moist - wood pieces		1 2
CLAYEY SILT TILL - trace sand, trace gravel; brown/grey, moist, very stiff	233.6	3 4
SILTY CLAY - grey, moist to very moist, very stiff	231.8	5 6 7
END OF BOREHOLE	228.3	8



NOTES:
1. Groundwater monitoring well installed to 7.62 m depth.

Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Well
June 30, 2021	Dry	Well

Log of Borehole MW5

Project No. GTR-00800029-D0

Project: Proposed Industrial Development

Location: Airport Road and Mayfield Road, Caledon, Ontario

Drawing No. 12

Sheet No. 1 of 1

Date Drilled: June 25, 2021

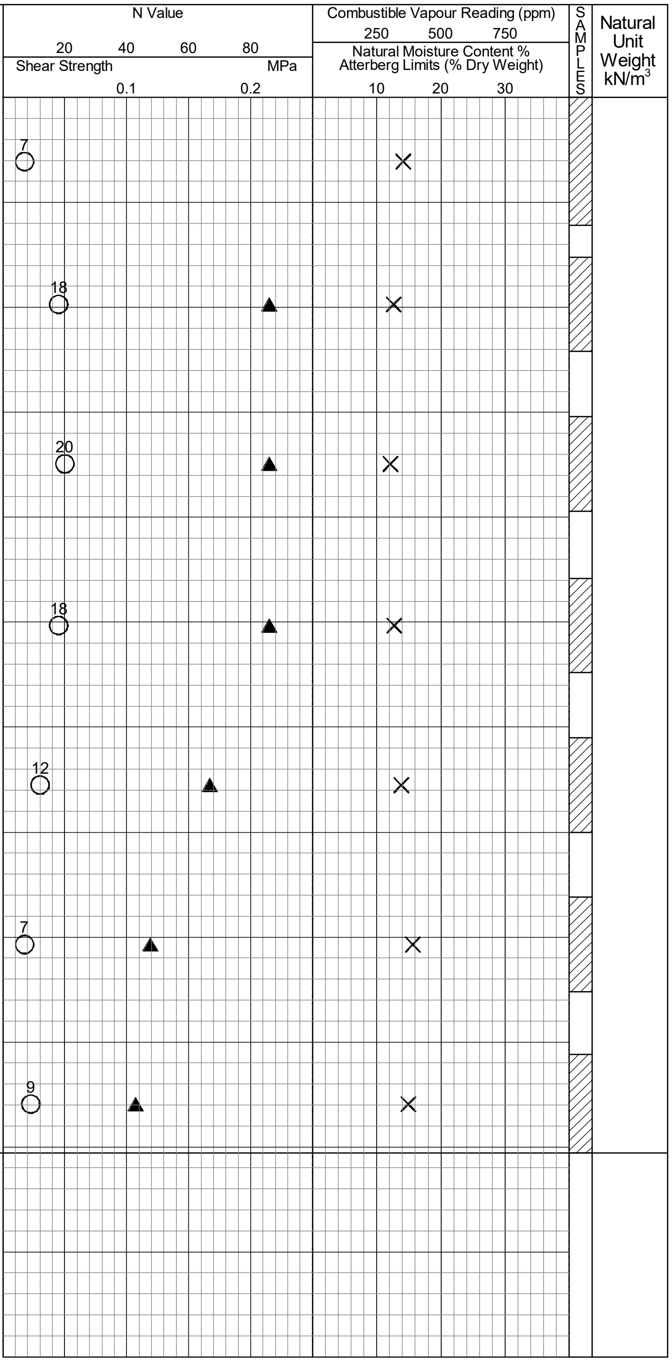
Drill Type: CME75 Track Mount

Datum: Geodetic

Auger Sample	☒
SPT (N) Value	○ ▨
Dynamic Cone Test	—
Shelby Tube	■
Field Vane Test	✚ S
Combustible Vapour Reading	☐
Natural Moisture	×
Plastic and Liquid Limit	├──○
Undrained Triaxial at % Strain at Failure	⊕
Penetrometer	▲

ELEV. m	DEPTH	Soil Description
233.01	0	**TOPSOIL** - approximately 390 mm thick - sandy silt with rootlets and organics; dark brown, moist
232.6		**FILL (POSSIBLE REWORKED NATIVE)** - sandy silt, trace gravel, trace rootlets; dark brown brown, moist
232.2		**CLAYEY SILT TILL** - trace sand, trace gravel; brown/grey, moist, very stiff
230.1		**SILTY CLAY** - grey, moist to very moist, very stiff
228.0	5	**END OF BOREHOLE**

NOTES:
1. Groundwater monitoring well installed to 4.56 m depth.



Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	Well
June 30, 2021	Dry	Well

LAGWGL02 GTR-00800029-D0 - AIRPORT ROAD AND MAYFIELD.GPJ NEW.GDT 7/19/21

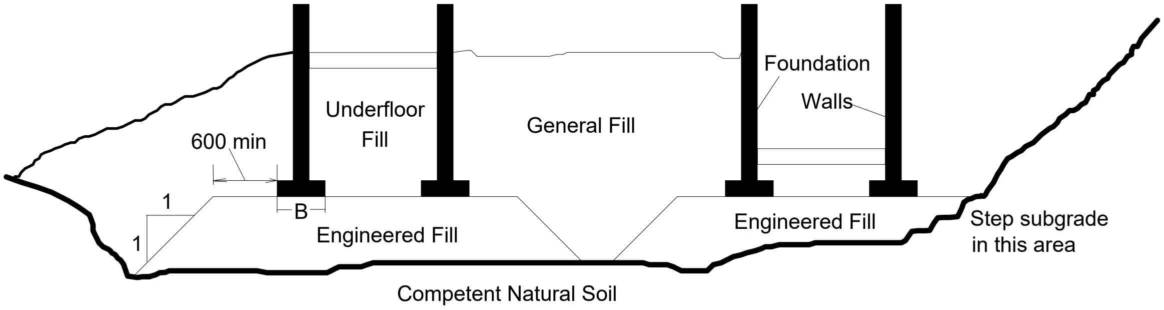
Appendix A

Engineered Fill

Foundations placed on engineered fill comprising native soil from the site - or imported materials - may be designed for an SLS geotechnical reaction of 150 kPa (ULS factored geotechnical resistance of 225 kPa).

Additional comments with regard to engineered fill are as follows:

- The area must be stripped of all topsoil, existing fill material or other deleterious material and proof-rolled. Soft spots must be dug out. The stripped native subgrade must be examined and approved by a geotechnical engineer prior to placement of fill.
- The approved engineered fill must be placed in loose lifts not exceeding 300 mm and compacted to 100% Standard Proctor dry density throughout. Granular fill is preferred.
- Full time geotechnical inspection during placement of engineered fill is required.
- The fill must be placed such that the specified geometry is achieved as follows:.

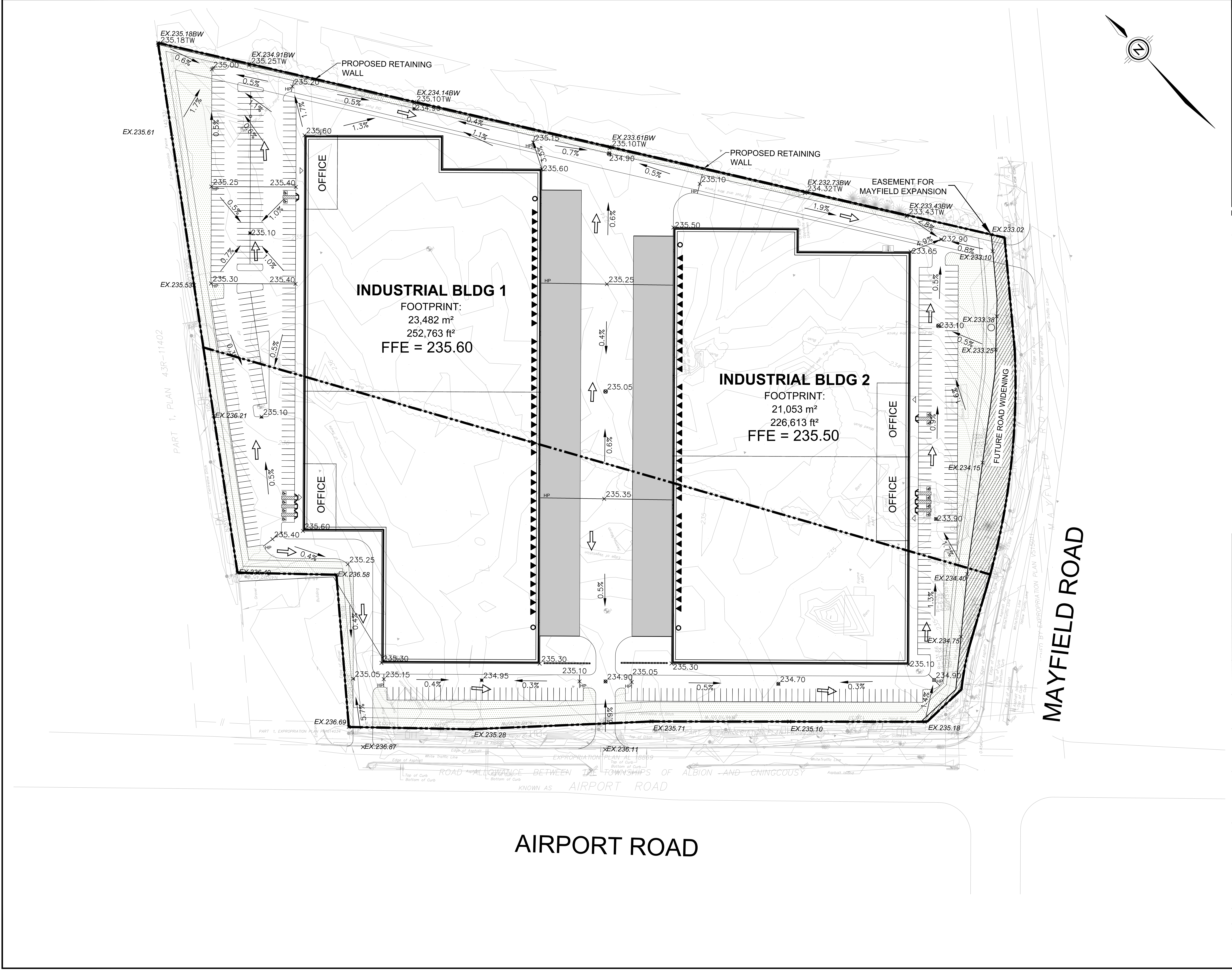


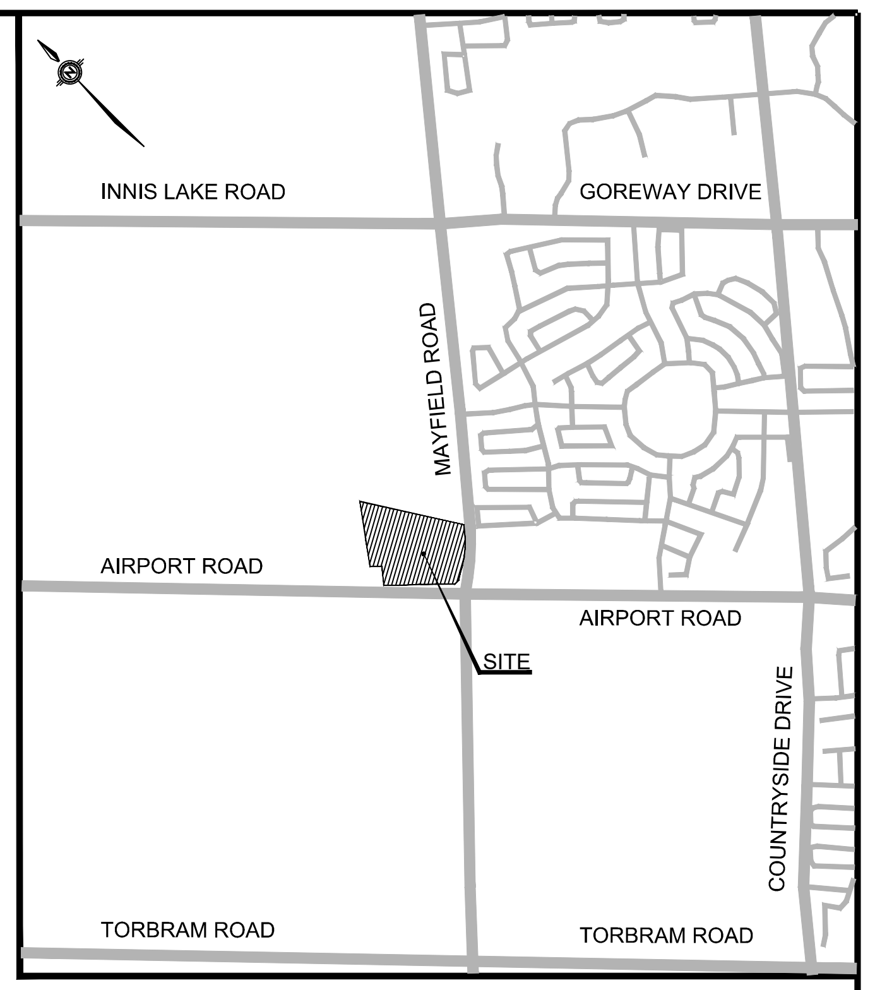
Foundations on Engineered Fill (schematic)

- A minimum footing width of 500 mm (20 inches) is suggested. It is recommended that poured concrete foundation walls should be reinforced with reinforcing steel designed by structural engineers.
- All excavations must be done in accordance with the Occupational Health and Safety Regulations of Ontario.

Appendix B

Grading Plan prepared by WSP





KEY PLAN NTS

LEGEND

‒ · ‒	LIMIT OF PROPERTY
EX.±216.25×	EX. ELEVATION
216.25×	PROP. ELEVATION
0.5%	PROPOSED SLOPE
⇨	OVERLAND FLOW DIRECTION
BW	BOTTOM OF WALL
TW	TOP OF WALL

SURVEY: DAVID J. PESCE SURVEYING

DATE OF SURVEY: JULY 13, 2011

NOTE: ALL ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO REGION OF PEEL BENCHMARK NO. 48, HAVING A POSTED ELEVATION OF 229.756 M. BENCHMARK IS LOCATED ON THE SOUTH FACE AT THE EAST CORNER OF GARAGE OF A RED BRICK BUNGALOW LOCATED ON THE NORTH SIDE OF SEVENTEENTH SIDEROAD (REGIONAL ROAD #14). APPROX. 0.80KM EAST OF AIRPORT ROAD

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
1	ISSUED FOR CLIENT REVIEW	G.W	2021-07-22	A.D.R

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
AIRFIELD DEVELOPMENTS INC. &
AIRFIELD DEVELOPMENTS II INC.

MUNICIPALITY
TOWN OF CALEDON

PROJECT TITLE
6034 MAYFIELD ROAD

SHEET TITLE
PRELIMINARY SITE
GRADING FIGURE

CONSULTANT
WSP
100 Commerce Valley Dr. West, Thornhill, ON Canada L3T 0A1
t: 905.882.1100 f: 905.882.0055 www.wsp.com

STAMP

DESIGNED	DRAWN	CHECKED
G.W	CAD 10/12	A.D.R.

SCALE	DATE
1:750	JULY 2021

DWG. NUMBER	SHEET NUMBER
211-07736	5

FILENAME: X:\DIV10\211-07736 - SmartCentres - 6034 Mayfield Road\Mun\Engineering Drawings\211-07736 SG_SS.dwg
PLOTDATE: Jul 22, 2021 - 7:01pm, CAGW071550