REPORT ON

Preliminary Geotechnical Investigation
Proposed Mixed Use
Residential - Commercial Development
Palermo Land
Dundas Street West & Bronte Road
Oakville, Ontario

PREPARED FOR:

Palermo Village Corp (PVC)

Project No: 19-323-100 **Date:** June 11, 2021



DS CONSULTANTS LTD.

6221 Highway 7, Unit 16 Vaughan, Ontario, L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca

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1. INTRODUCTION

DS Consultants Ltd. (DS) was retained by Palermo Village Corp (PVC) to carry out a geotechnical investigation for the proposed mixed use residential - commercial development located at Palermo Land, at Dundas Street west and Bronte Road, Oakville, Ontario.

It is understood that the proposed subdivision will consist of low-rise, mid-rise and high-rise residential development with one level of basement or more. The finish floor elevation of the proposed construction, and the invert of the site services is not known to us at the time of writing this report.

The purpose of this geotechnical investigation was to obtain information about the subsurface conditions at sixty-five (65) borehole locations and from the findings in the boreholes to make engineering recommendations pertaining to the geotechnical design of residential development including underground utilities, roads and to comment on the foundation conditions for the building construction.

This report deals with geotechnical issues only. The findings of Phase 1 and Phase 2 Environmental Site Assessment (ESA) by DS will be documented in separate reports.

In addition, a geohydrology study is carried out by others. Therefore, comments regarding the type and extent of groundwater control required should be obtained from the geohydrology report.

This report is provided on the basis of the terms of reference presented above and, on the assumption, that the design will be in accordance with the applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the design. It may then be necessary to carry out additional borings and reporting before the recommendations of this office can be relied upon.

The format and contents are guided by client specific needs and economics and do not conform to generalized standards for services. Laboratory testing for most part follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

This report has been prepared for Palermo Village Corp (PVC) and its architect and designers. Third party use of this report without DS consent is prohibited.

2. FIELD AND LABORATORY WORK

A total of sixty-six (66) boreholes (BH21-1 to BH21-15, BH21-19 to BH21-68 and BH21-52A, see Drawing 1 for borehole locations) were drilled at the subject site by DS, to depths ranging from 2.1 to 13.8m.

It should be noted that boreholes BH21-16, BH21-17 and BH21-18 were not drilled and were replaced with BH21-30, BH21-36 and BH21-68 for slope stability study.

Boreholes (BH21-30, BH21-36 and BH21-68, see Drawing 1 for borehole locations) were drilled at the subject site to depths ranging from 5.5 to 7.7m to shale bedrock, to conduct a slope stability study in the area of the creek, located to the west of the property. This slope stability study will be issued in a separate report.

The boreholes were drilled with solid and hollow stem continuous flight augers equipment by a drilling sub-contractor under the direction and supervision of DS personnel. Samples were retrieved at regular intervals with a 50 mm O.D. split-barrel sampler driven with a hammer weighing 624 N and dropping 760 mm in accordance with the Standard Penetration Test (SPT) method. The samples were logged in the field and returned to the DS laboratory for detailed examination by the project engineer and for laboratory testing.

As well as visual examination in the laboratory, all soil samples from geotechnical boreholes were tested for moisture contents. Grain size analyses of twenty four (24) selected soil samples were conducted and the results are presented in Drawings 68 and 69. Atterberg Limits testing were conducted on twenty one (21 soil samples and results are presented on the respective borehole logs.

Water level observations were made during and upon completion of drilling. Twelve (12) monitoring wells of 50mm diameter were installed in boreholes BH21-1 to BH21-8, BH21-15, BH21-30, BH21-36 and BH21-68 for the long-term groundwater levels monitoring.

The elevation surveying of the borehole locations was undertaken by DS Consultants Ltd. personnel, using the differential GPS unit.

3. SUBSURFACE CONDITIONS

The borehole location plan is shown on **Drawing 1**. General notes on sample description are provided on **Drawing 1A**. The subsurface conditions in the boreholes by DS are presented in the individual borehole logs presented on **Drawings 2 to 67**.

3.1 Soil and Bedrock Conditions

Topsoil:

A surficial topsoil layer, varying from 150 to 280 mm in thickness, was present at the surface of all the boreholes. It should be noted that the thickness of the topsoil explored at the borehole locations may not be representative for the site and should not be relied on to calculate the amount

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of topsoil at the site. Shallow hand-dug test-pits should be carried out to calculate the amount of topsoil at site accurately.

Fill and Weathered/Disturbed Soils:

In BH21-10, sandy silt fill with 150 mm asphalt paving at surface was found extending to a depth of 0.8 m. In BH21-11, sand and gravel fill was found to a depth of 0.8 m. In all other boreholes, weathered/disturbed clayey silt with inclusions of topsoil and organics was found below the topsoil, extending to a depth of 0.8 m. The weathered/disturbed clayey silt was generally very soft to firm in consistency, with some stiff layers in some boreholes.

Glacial Till (Clayey Silt Till, Silty Clay Till, Sandy Silt Till):

Below the topsoil, glacial till deposits (varying from clayey silt to silty clay/till to sandy silt till) were encountered in all the boreholes, overlying till shale complex/shale bedrock. However, boreholes BH21-10 to BH21-15 were terminated in this till deposit. The sandy silt till deposits were found in a very dense state with, measured SPT 'N' value more than 100 blows per 300 mm of penetration.

Grain size analyses of three sandy silt till samples were conducted and the result is presented in **Drawings 68 and 69**, with the following fractions:

Clay: 8 to 17% Silt: 43 to 47% Sand: 22 to 29% Gravel: 14 to 20%

The clayey/till deposits were found to have a firm to hard consistency, with measured SPT 'N' values ranging from 7 to more than 50 blows per 300 mm of penetration.

Grain size analyses of twenty one (21) clayey till samples were conducted and the results are presented in **Drawings 68 and 69**, with the following fractions:

Clay: 17 to 42% Silt: 45 to 56% Sand: 10 to 26% Gravel: 1 to 7%

Atterberg limits tests of the twenty one (21) above clayey till samples were conducted. The results are shown on the borehole logs and are summarized as follows:

Liquid limit (W_L): 25.9 to 40.5% Plastic limit (W_P): 13.9 to 18.7% Plasticity index (PI): 8.7 to 21.8 %

Clayey/Sandy Silt Till/ Shale Complex:

Below the silt till in about twenty three Borehole locations, at approximate depths ranging from 2.1 to 7.3m and extending to approximate depths ranging from 3.1 to 8.2m, a deposit of clayey silt and sandy silt till / shale complex was found overlying shale bedrock. This deposit generally consisted of clayey silt till/sandy silt till mixed with highly weathered shale. This deposit was found to have generally a very stiff to hard consistency, with measured SPT 'N' values varying from 29 to more than 50 blows per 300 mm of penetration and very dense, with measured SPT 'N' value of more than 100 blows per 300 mm.

Boreholes BH21-6, BH21-7 and BH21-8 were terminated in this deposit at this at depths of 8.2, 8.0 and 5.2m due to auger refusal, probably due to shale bedrock.

Shale Bedrock:

Shale bedrock of Queenston Formation was encountered in all the boreholes except BH21-10 to BH21-15 and BH21-10 to BH21-15, BH21-6, BH21-7 and BH21-8. The shale bedrock was encountered at depths ranging from 3.1 to 12.2m below the existing grade, corresponding to Elevations varying from 138.8 to 160.0m. Shale bedrock was not proven by rock coring. The depth and elevation of the shale bedrock surface in the boreholes are presented on the borehole records attached to this report.

Because of the method of drilling and sampling, the surface elevations of the bedrock can be different than indicated on the borehole logs. With augering, the auger may penetrate some of the more weathered shale and the coring may therefore begin below the bedrock surface. Commonly the overburden overlying the shale contains slabs of limestone which would give a false indication of the bedrock level. Similarly, the depth of weathering cannot be determined accurately due to the presence of limestone layers.

The shale bedrock generally contains layers of siltstone, limestone and dolostone. Typically, the hard layers comprise about 15 to 20 percent of the unit. However, higher concentrations of hard layers can be present. The hard layers are usually less than 100 to 150 mm thick, but some layers are much thicker. The thicker layers have been observed to be as much as 750 to 900 mm at other sites. The layers are actually lenses and they can vary significantly in thickness over short distance.

Methane gas is anticipated in the bedrock. Appropriate care and monitoring is essential in all confined bedrock excavations. Stress relief features such as folds and faults are common in the shale bedrock. **Appendix A** presents more details and general comments about the shale bedrock.

3.2 Groundwater Conditions

Stabilized groundwater levels in the monitoring wells were recorded at depths ranging from 2.3 to 6.7 m below the existing grade, corresponding to Elevations 148.0 to 161.1 m. The groundwater levels measured in the monitoring wells are summarized in **Table 2**.

Table 2: Summary of Groundwater Level Measurements in Monitoring Wells

Borehole	Ground Surface	Date of	Depth of	Elevation of
No.	Elev. (m)	Observation	Groundwater	Groundwater
			(m)	(m)
BH21-1	153.7	Mar. 11/21	3.1	150.6
BH21-2	157.2	Mar. 1/21	4.6	152.6
BH21-3	164.8	May 9/21	4.2	160.6
BH21-4	162.0	Mar. 1/21	3.4	158.6
BH21-5	159.5	Mar. 1/21	3.1	156.4
BH21-6	156.7	Feb. 25/21	6.7	150.0
BH21-7	152.6	Feb. 25/21	1.2	151.4
BH21-8	164.3	May 9/21	3.1	161.2
BH21-15	152.4	May 9/21	4.4	148.0
BH21-30	160.5	April 14/21	2.3	158.2
BH21-36	160.0	April 14/21	2.4	157.6
BH21-68	161.1	April 14/21	5.2	155.9

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations in response to major weather events.

Therefore, reference should be made to the hydrogeology study report prepared by Others for further details on the volume flow and groundwater control.

4. DISCUSSION AND RECOMMENDATIONS

It is proposed to develop the site as a residential subdivision. The lots will therefore be serviced by a network of roads, storm and sanitary sewers and watermains.

4.1 SITE GRADING & ENGINEERED FILL

The site will be developed as residential subdivision with residential lots, roads and driveways, it is recommended that all fill to be placed for grading purposes be constructed as engineered fill to provide competent subgrade below house foundations, roads, boulevards, etc.

Prior to placement of engineered fill, all existing topsoil, fill materials and weathered/disturbed native soils containing topsoil/organics and other unsuitable materials should be stripped to expose the inorganic subgrade. The exposed subgrade should then be proof rolled with a heavy sheepsfoot

roller to identify weak areas. Any weak or excessively wet zones identified during proof-rolling should be sub-excavated and replaced with compacted competent material to establish stable and uniform conditions. Prior to placement of engineered fill, the subgrade should be inspected and approved by a geotechnical engineer.

General guidelines for the placement and preparation of engineered fill are presented on **Appendix B**. Bearing capacity values of 150 kPa at SLS and 225 kPa at ULS can be used on engineered fill, provided that all requirements on **Appendix B** are adhered to. To reduce the risk of improperly placed engineered compacted fill, full-time supervision of the contractor is essential.

The following is a recommended procedure for an engineered fill:

- 1. Prior to site work involving engineered fill, a site meeting to discuss all aspects must be convened. The surveyor, contractor, design engineer and geotechnical engineer must attend the meeting. At this meeting, the limits of the engineered fill will be defined. The contractor must make known where all fill material will be obtained and samples must be provided to the geotechnical engineer for review, and approval before filling begins.
- 2. Detailed drawings indicating the lower boundaries as well as the upper boundaries of the engineered fill must be available at the site meeting and be approved by the geotechnical engineer.
- 3. The building footprint and base of the pad, including basements, garages, etc. must be defined by offset stakes that remain in place until the footings and service connections are all constructed. Confirmation that the footings are within the pad, service lines are in place, and that the grade conforms to drawings, must be obtained by the owner in writing from the surveyor and DS. Without this confirmation no responsibility for the performance of the structure can be accepted by DS. Survey drawing of the pre and post fill location and elevations will also be required.
- 4. The area must be stripped of all topsoil and fill materials. Subgrade must be proof-rolled. Soft spots must be dug out. The stripped native subgrade must be examined and approved by a DS engineer prior to placement of fill.
- 5. The approved engineered fill must be compacted to 100% Standard Proctor Maximum Dry Density throughout. Granular Fill preferred. Engineered fill should not be placed (where it will support footings) during the winter months. Engineered fill compacted to 100% SPMDD will settle under its own weight approximately 0.5% of the fill height and the structural engineer must be aware of this settlement. In addition to the settlement of the fill, additional settlement due to consolidation of the underlying soils from the structural and fill loads will occur.
- 6. Full-time geotechnical inspection by DS during placement of engineered fill is required. Work cannot commence or continue without the presence of the DS representative.

- 7. The fill must be placed such that the specified geometry is achieved. Refer to sketches for minimum requirements. Take careful note that the projection of the compacted pad beyond the footing at footing level is a minimum of 2 m. The base of the compacted pad extends 2 m plus the depth of excavation beyond the edge of the footing.
- 8. Bearing capacity values of 150 kPa at SLS and 225 kPa at ULS may be used provided that all conditions outlined above are adhered to. A minimum footing width of 500 mm (20 inches) is suggested and footings should be provided with nominal steel reinforcement.
- 9. All excavations must be done in accordance with the Occupational Health and Safety Regulations of Ontario.
- 10. After completion of the pad a second contractor may be selected to install footings. All excavations must be backfilled under full time supervision by DS to the same degree as the engineered fill pad. Surface water cannot be allowed to pond in excavations or to be trapped in clear stone backfill. Clear stone backfill can only be used with the approval of DS.
- 11. After completion of compaction, the surface of the pad must be protected from disturbance from traffic, rain and frost.
- 12. If there is a delay in construction, the engineered fill pad must be inspected and accepted by the geotechnical engineer. The location of the structure must be reconfirmed that it remains within the pad.

The native soils and existing fill materials free from topsoil and organics to be excavated are considered suitable for re-use as engineered fill, provided that their moisture contents at the time of construction are at or near optimum. Clayey tills are likely to be excavated in cohesive chunks or blocks and will be difficult to compact. They should be pulverized and placed in thin layers not exceeding 200 mm and compacted using heavy equipment suitable for these types of soils (e.g. heavy sheepsfoot compactors).

4.2 ROADS/PAVEMENTS

The investigation has shown that the predominant subgrade soil, after stripping the topsoil, fill and otherwise unsuitable subsoil, will generally consist of silty clay till and shale bedrock.

Based on the above and assuming that traffic usage will be residential, the following minimum pavement thickness is recommended for roads to be constructed within the development:

For Minor Local or local roads

40 mm HL3 Asphaltic Concrete 60 mm HL8 Asphaltic Concrete 150 mm Granular 'A' 350 mm Granular 'B'

For collector roads

40 mm HL3 Asphaltic Concrete 80 mm HL8 Asphaltic Concrete 150 mm Granular 'A' 350 mm Granular 'B'

These values may need to be adjusted according to the Town of Oakville Standards. The site subgrade and weather conditions (i.e. if wet) at the time of construction may necessitate the placement of thicker granular sub-base layer in order to facilitate the construction. Furthermore, heavy construction equipment may have to be kept off the newly constructed roads before the placement of asphalt and/or immediately thereafter, to avoid damaging the weak subgrade by heavy truck traffic.

Driveway pavements should be constructed as per the Town of Oakville standards.

4.2.1 STRIPPING, SUB-EXCAVATION AND GRADING

The site should be stripped of all topsoil, fill materials and weathered/disturbed soils containing topsoil/organics or otherwise unsuitable soils to the full depth of the roads, both in cut and fill areas. Following stripping, the site should be graded to the subgrade level and approved. The subgrade should then be proof rolled, in the presence of the Geotechnical Engineer, by at least several passes of a heavy compactor having a rated capacity of at least 8 tonnes. Any soft spots thus exposed should be removed and replaced by select fill material, similar to the existing subgrade soil and approved by the Geotechnical Engineer. The subgrade should then be recompacted from the surface to at least 98% of its Standard Proctor Maximum Dry Density (SPMDD). The final subgrade should be cambered or otherwise shaped properly to facilitate rapid drainage and to prevent the formation of local depressions in which water could accumulate.

Owing to the clayey (i.e. impervious) nature of some subsoils at the site, proper cambering and allowing the water to escape towards the sides (where it can be removed by means of subdrains) is considered to be beneficial for this project. Otherwise, any water collected in the granular subbase materials could be trapped thus causing problems due to softened subgrade, differential frost heave, etc. For the same reason damaging the subgrade during and after placement of the granular

materials by heavy construction traffic should be avoided. If the moisture content of the local material cannot be maintained at $\pm 2\%$ of the optimum moisture content, imported granular material may need to be used.

Any fill required for re-grading the site or backfill should be select, clean material, free of topsoil, organic or other foreign and unsuitable matter. The fill should be placed in thin layers and compacted to at least 98% of its SPMDD. The compaction of the new fill should be checked by frequent field density tests.

4.2.2 CONSTRUCTION

Once the subgrade has been inspected and approved, the granular base and sub-base course materials should be placed in layers not exceeding 200 mm (uncompacted thickness) and should be compacted to at least 100% of their respective SPMDD. The grading of the material should conform to current OPS Specifications.

The placing, spreading and rolling of the asphalt should be in accordance with OPS Specifications or, as required by the local authorities.

Frequent field density tests should be carried out on both the asphalt and granular base and subbase materials to ensure that the required degree of compaction is achieved.

4.2.3 DRAINAGE

The Town of Oakville requires the installation of full-length subdrains on all roads. The subdrains should be properly filtered to prevent the loss of (and clogging by) soil fines.

All paved surfaces should be sloped to provide satisfactory drainage towards catch-basins. As discussed in Section 4.2.1, by means of good planning any water trapped in the granular sub-base materials should be drained rapidly towards subdrains or other interceptors.

4.3 UNDERGROUND UTILITIES

As a part of the site development, a network of new watermains, storm and sanitary sewers will be constructed. It is assumed that the trenches will generally be within 4 to 5 m below the existing grade.

4.3.1 TRENCHING

The boreholes show that below the existing topsoil and fill, the trenches will be predominantly dug through the glacial tills (clayey silt till, silty clay till, sandy silt till, till/shale complex and shale bedrock. Excavations can be carried out with heavy hydraulic backhoe. Groundwater levels in the monitoring wells were recorded at depths ranging from 3.9 to 4.6 m below the existing grade,

corresponding to Elevations 160.5 to 161.1 m. No major problems due to groundwater seepage are anticipated during construction in trenches dug through the clayey soils and shale bedrock. It is expected that any seepage, which occurs during wet periods or from the wet sand seams/layers in the till, can be removed by pumping from sumps.

Excavation of the shale can be carried out using heaviest available single tooth ripper equipment. The limestone beds are present and may overly the shale bedrock surface at some locations. It may be necessary at some locations to utilize jackhammer type equipment to "open" the limestone layers for the ripper.

The sides of excavations in the natural strata can be expected to be temporarily stable at relatively steep side slopes for short periods of time but they should be cut back at slopes no steeper than 1:1 in order to comply with the safety regulations. Where wet sand and sandy silt layers in the till are encountered, flattened slopes will be required.

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, fill material can be classified as Type 3 Soil above the groundwater table and Type 4 Soil in perched water conditions. The very stiff to hard clayey silt to silty clay till can be classified as Type 2 Soil above the groundwater table and Type 3 Soil below the groundwater table. Sandy soil can be classified as Type 3 soil above groundwater and as Type 4 soil below groundwater.

It should be noted that the till is a non-sorted sediment and therefore contain cobble and boulders. Possible large obstructions such as buried concrete pieces are also anticipated in the fill material. Provisions must be made in the excavation contract for the removal of possible boulders in the till, obstructions in the fill material and limestone layers in shale bedrock.

4.3.2 BEDDING

The boreholes show that the pipes will predominantly be laid within the native soils which will provide adequate support for the sewer pipes and allow the use of normal Class B type bedding. The bedding should conform to the current Ontario Provincial Standard specifications (OPSS 401/OPSD 802) and/or standards set by the local municipality.

The recommended minimum thickness of granular bedding below the invert of the pipes is 150 mm. The thickness of the bedding may, however, have to be increased depending on the pipe diameter or in accordance with local standards or if wet or weak subgrade conditions or fill materials are encountered at the trench base level. The bedding material should consist of well graded granular material such as Granular 'A' or equivalent. After installing the pipe on the bedding, a granular surround of approved bedding material, which extends at least 300 mm above the obvert of the pipe, or as set out by the local Authority, should be placed. Where the bedding

falls below the anticipated water table, the bedding stone must be surrounded with a geotextile filter cloth.

To avoid the loss of soil fines from the subgrade, uniformly graded clear stone should not be used unless, below the granular bedding material, a suitable, approved filter fabric (geotextile) is placed. The geotextile should extend along the sides of the trench and should be wrapped all around the poorly graded bedding material.

For deep trenches (if any), i.e. more than 2.0 m below the shale surface, a minimum 50 mm thick polystyrene etc. layer will be required at both sides of the pipe to avoid rock squeezing. The polystyrene layer should extend vertically to at least 0.3 m above the pipe. The rock trench should be wide enough so that at each side, the horizontal distance between the pipe side and the cut rock surface is at least 0.3 m.

4.3.3 BACKFILLING OF TRENCHES

Based on visual and tactile examination, the on-site excavated inorganic native soils are considered to be suitable for re-use as backfill in the service trenches provided their moisture contents at the time of construction are within 2 percent of their optimum moisture content.

The clayey deposits especially when its consistency is hard is likely to be excavated in cohesive chunks or blocks and will be difficult to compact in confined areas. For use as backfill, the clayey material will have to pulverized and placed in thin layers. The clayey soils will have to be compacted using heavy equipment suitable for these soils which may be difficult to operate in the narrow confines of the trenches. Unless the clayey materials are properly pulverized and compacted in sufficiently thin lifts post-construction settlements could occur. Their use in narrow trenches such as laterals (where heavy compaction equipment cannot be operated) may not be feasible.

Selected inorganic fill and the native soils free from topsoil and organics can be used as general construction backfill where it can be compacted with sheep's foot type compactors. Loose lifts of soil, which are to be compacted, should not exceed 200 mm. Depending on the time of construction and weather, some excavated material may be too wet to compact and will require aeration prior to its use.

Imported granular fill, which can be compacted with handheld equipment, should be used in confined areas.

The excavated soils are not considered to be free draining. Where free draining backfill is required, imported granular fill such as OPSS Granular B should be used.

The backfill should be placed in maximum 200 mm thick layers at or near (±2%) their optimum moisture content and each layer should be compacted to at least 95% SPMDD. In the upper 1.5 m

of subgrade, underneath the road base, the compaction should be increased to 98% SPMDD. Unsuitable materials such as organic soils, boulders, cobbles, frozen soils, etc. should not be used for backfilling.

The on-site excavated soils and especially the clayey soils should not be used in confined areas (e.g. around catch-basins and laterals under roadways) where heavy compaction equipment cannot be operated. The use of imported granular fill together with an appropriate frost taper would be preferable in confined areas and around structures, such as catch-basins.

It should be noted that the excavated soils are subject to moisture content increase during wet weather which would make these materials too wet for adequate compaction. Stockpiles should be compacted at the surface or be covered with tarpaulins to minimize moisture uptake.

4.3.4 ANTI SEEPAGE COLLARS/TRENCH PLUGS

For sewer installed under the groundwater table, seepage between the trench backfill material and the trench wall may cause erosion of the backfill materials. It is recommended that nominal anti-seepage collars (maximum spacing 50m) be provided to prevent erosion of the backfill materials. Anti seepage collar should not be located at pipe joint.

The anti-seepage collar may consist of a clay plug surrounding the sewer pipe. A typical clay plug will be about 1 m thick and extends laterally to a minimum distance of 0.5 m from the pipe circumference with a minimum of 0.3 m embedment into the shale or native sub-grade.

The on-site native silty clay soils may be suitable for such purpose subject to additional sampling and testing.

4.3.5 THRUST BLOCKS AND JOINT RESTRAINTS

For the design of thrust blocks on undisturbed native soils or engineered fill, an allowable (or SLS) bearing resistance of 150 kPa and factored ULS bearing resistance of 225 kPa can be used.

4.4 FOUNDATION CONDITIONS

4.4.1 House Foundations

It is understood that the proposed subdivision will consist of single-family homes (detached, and townhomes) with one level of basement.

The native soils encountered in the boreholes are competent to support the proposed houses on conventional footings. The spread and strip footings founded on the undisturbed native soils/bedrock can be designed for a bearing capacity of 200 kPa at SLS (Serviceability Limit State),

and for a factored geotechnical resistance of 300 kPa at ULS (Ultimate Limit State), at or be low a depth of 1.2 m below existing grades.

Subject to design grades, higher bearing capacity values are available for hard native soils and bedrock, if required.

Should the proposed footings be founded above the competent native soils, subject to design grades, the proposed houses can also be supported by spread and strip footings founded on engineered fill for a bearing capacity of 150 kPa at the serviceability limit states (SLS) and for a factored geotechnical resistance of 225 kPa at the ultimate limit states (ULS), provided all requirements in section 4.1 and **Appendix B** are adhered to.

Foundations designed to the specified bearing capacities at the serviceability limit states (SLS) are expected to settle less than 25 mm total and 19 mm differential.

All footings exposed to seasonal freezing conditions must have at least 1.2 metres of soil cover for frost protection.

Where it is necessary to place footings at different levels, the upper footing must be founded below an imaginary 10 horizontal to 7 vertical line drawn up from the base of the lower footing. The lower footing must be installed first to help minimize the risk of undermining the upper footing.

It should be noted that the recommended bearing capacities have been calculated by DS from the borehole information for the design stage only. The investigation and comments are necessarily on-going as new information of the underground conditions becomes available. For example, more specific information is available with respect to conditions between boreholes when foundation construction is underway. The interpretation between boreholes and the recommendations of this report must therefore be checked through field inspections provided by DS to validate the information for use during the construction stage.

4.4.2 Mid and High-rise Building Foundations

The proposed mid and high-rise building locations, number of floors/underground parking levels and design grades are not known at this stage. Therefore, recommendations regarding bearing pressures and other geotechnical parameters can be provided when the proposed building design information is available, due to the difference in ground elevations. The soil conditions are capable of supporting the mid-rise and high-rise development on conventional foundations.

4.5 FLOOR SLAB

The house floor slab can be supported on grade provided all topsoil, fill, and surficially weathered/disturbed native soils are removed and the base thoroughly proof rolled.

The fill required to raise the grade can consist of inorganic soil, placed in shallow lifts and compacted to 98 percent of Standard Proctor Maximum Dry Density (SPMDD).

Where engineered fill is used to support the foundations, the floor slab can also be supported by engineered fill.

A moisture barrier consisting of at least 200 mm of 19 mm clear crushed stone should be installed under the floor slab.

A perimeter and underfloor drainage system will be required, as shown on **Drawing 70**.

4.6 EARTH PRESSURES

The lateral earth pressures acting on retaining walls or underground structures may be calculated from the following expression:

$$p = k(\gamma h + q)$$

where, p = Lateral earth pressure in kPa acting at depth h

K = Earth pressure coefficient, assumed to be 0.40 for vertical walls and horizontal backfill for permanent construction

γ = Unit weight of backfill, a value of 21 kN/m3 may be assumed

h = Depth to point of interest in metres

q = Equivalent value of surcharge on the ground surface in kPa

The above expression assumes that the perimeter drainage system prevents the build up of any hydrostatic pressure behind the wall.

4.7 EARTHQUAKE CONSIDERATIONS

Based on the borehole information and according to Table 4.1.8.4.A of OBC 2012, the subject site for the proposed buildings can be classified as 'Class C' for seismic site response

5. GENERAL COMMENTS AND LIMITATIONS OF REPORT

DS Consultants Ltd. (DS) should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, DS will assume no responsibility for interpretation of the recommendations in the report.

This report is intended solely for the Client named. The material in it reflects our best judgment in light of the information available to DS at the time of preparation. Unless otherwise agreed in

writing by DS, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the test hole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the test holes may differ from those encountered at the test hole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the test hole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of test holes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. DS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.

DS CONSULTANTS LTD.

Palermo Land, Oakville, Ontario



ROFESSION .

F. ZHU

POE OF ONTARIO

Labib Mousa, P. Eng.

Fanyu Zhu, Ph.D., P.Eng.

habble Baselulovala \$4 For P. Ford

Project No.: 20-078-100- Geotechnical Investigation Proposed Residential Development 1297 Dundas Street, Oakville, Ontario

Drawings

Project No.: 20-078-100- Geotechnical Investigation Proposed Residential Development 1297 Dundas Street, Oakville, Ontario

Appendix A General Comments on Bedrock in Toronto Area

DS Consultants Ltd. December 15, 2020

Project No.: 20-078-100- Geotechnical Investigation Proposed Residential Development 1297 Dundas Street, Oakville, Ontario

Appendix B General Requirements for Engineered Fill

DS Consultants Ltd. December 15, 2020

Project No.: 19-323-100- Geotechnical Investigation Proposed Residential Development 3069 Dundas St W, Oakville, ON

Drawings

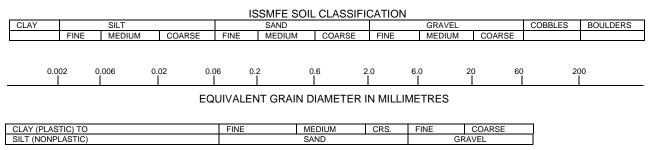
DS Consultants Ltd. December 15, 2020



Project No.: 19-323-100

Drawing 1A: Notes On Sample Descriptions

1. All sample descriptions included in this report generally follow the Unified Soil Classification. Laboratory grain size analyses provided by DS also follow the same system. Different classification systems may be used by others, such as the system by the International Society for Soil Mechanics and Foundation Engineering (ISSMFE). Please note that, with the exception of those samples where a grain size analysis and/or Atterberg Limits testing have 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.



UNIFIED SOIL CLASSIFICATION

- 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 preliminary 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 (60 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.



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

Method: Solid Stem Auger Diameter: 150mm

DRILLING DATA

REF. NO.: 19-323-100

Date: Mar-01-2021 ENCL NO.:

JI (LI	HOLE LOCATION: See Drawing 1 N 4 SOIL PROFILE		1	SAMPL					DYNA RESIS	MIC CO	NE PEI	NETR/	ATION		DI AOTT	n NAT	URAL	1101		Ļ.	METHANI
m)		Τ̈́				GROUND WATER	,,				0 60			00	LIMIT		ITENT	LIQUID LIMIT W _L T (%)	a) EN	N L	AND
.EV	DECODIDE	P.C	_		BLOWS 0.3 m	*	ONS	N O	SHE/	R ST	RENGT	H (kl	^D a)		W _P		w 0	WL	KET F	AL U	GRAIN SIZ DISTRIBUTI
PTH	DESCRIPTION	ATA	BEF	ш	0.3	١Ž	ΠI	ΛΑΤ		NCONF		+	FIELD V & Sensiti	ANE vity			ONTEN	T (%)	80	ATUR ((%)
53.7		STRATA PLOT	NUMBER	TYPE	ž	GRC	CO	ELEVATION			RIAXIAL 0 60			OO OO				30		z	GR SA SI
9.9 0.2	TOPSOIL: 200mm CLAYEY SILT: sandy, trace gravel,	11/2	1	SS	3	V		-Ceme	nt								0				
2.9	trace topsoil/rootlets, brown, moist,							153													
0.8	soft (weathered) CLAYEY SILT TILL: sandy, trace		2	SS	29			100													
	gravel, occasional cobble/boulder, brown, moist, very stiff to hard				20			-Bento	ŀ												
			3	SS	29			152								0					
	grey below 2.3 m		4	SS	41																
						Ţ] : Z :	151													
			5	SS	35			W. L. Mar 01	, 2021	m 						0					
							-	-Slotte	d Pipe												
9.1																					
1.6	SANDY SILT TILL: trace clay, trace gravel, reddish brown, moist, very dense		6	ss ,	50/ 150mn			149													
	,							-Bento													
7.6								148													
6.3	SHALE BEDROCK: weathered,	#	7	SS_	50/ 25m										<u> </u>				_		
	END OF BOREHOLE: Notes:																				
	50mm dia. monitoring well installed upon completion.																				
	Water level Reading: Date: Water Level (mbgl):																				
	March 1, 2021 3.1																				
						ı									1				l		



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Feb-26-2021 ENCL NO.:

	HOLE LOCATION: See Drawing 1 N SOIL PROFILE	.0102	1	SAMPL					DYNA RESIS	MIC CC	ONE PE E PLOT	NETR/	ATION		PLASTI	c NAT	URAL STURE	HOHE		Ļ	METHAN
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER	CONDITIONS	_	SHEA O U	20 4 AR STI NCONF UICK T	RENG	0 8 ΓΗ (ki + - ×	Pa) FIELD W & Sensit LAB V	OO ANE ivity ANE OO	LIMIT W _P ⊢— WA¹	CON V TER CO	TENT W O ONTEN	LIQUID LIMIT W _L ——I T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT W (kN/m³)	AND GRAIN SIZ DISTRIBUTI (%) GR SA SI
15 0 . 9	TOPSOIL: 230mm CLAYEY SILT: trace gravel, trace topsoil/rootlets, brown, moist, firm		1	SS	3	4		-Ceme	nt									0			
0.8	(weathered) CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff		2	SS	27			156								0					
	graver, brown, moist, very still		3	ss	20			100								0					
54.9	SANDY SILT TILL: some clay,			33				-Bento	⊧ nite— F												
2.0	trace gravel, brown, moist, very dense		. 4	SS	50/ 150mr											0					
			5	SS	50/ 280mr			154								0					
								153													
52.6 4.6	CLAYEY SILT TILL/SHALE COMPLEX: trace sand, trace		6	ss	29			W. L. ′ Mar 01	152.6 , 202 ²	m I					0						
	gravel, weathered shale, reddish brown, very stiff to hard							Mar 01	d Pipe												
51.1 5 6.9	SHALE BEDROCK: weathered,		7	SS	50/			-Bento	E nite—												
	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water level Reading: Date: Water Level (mbgl): March 1, 2021 4.6																				



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

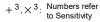
Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Feb-26-2021 ENCL NO.:

	SOIL PROFILE		Ģ	SAMPL		.563			DYNA	MIC CC	NE PE E PLOT	NETR/	NOITA								
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER		BLOWS 0.3 m	GROUND WATER	IDITIONS	ELEVATION	SHEA O UI	R STI	0 6 RENG INED	0 8 TH (kF +	Pa) FIELD V	OO ANE	PLASTIC LIMIT W _P	CON	URAL TURE TENT W D	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (KN/m³)	METHANE AND GRAIN SIZE DISTRIBUTIO (%)
164.8			NON	TYPE	ž	GRC	8 8	ELE			RIAXIA 0 6			ANE 00				30		Ž	GR SA SI (
16 4.6 0.2	TOPSOIL: 190mm CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist,		1	ss	6	M	X	-Ceme	nt								c				Metals and ORPs, PAH
164.0 1 0.8	firm (weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	29			164								0					PHCs
	brown, moist, very stiff to hard		3	ss	34			163								0					VOCs, pH
2			4	ss	42			-Bento	rite							0					
3				- 55	42			162								0					
			5	SS	45			161								0					
4						∴¤		W. L. 1													
159.7 5.1	CLAYEY SILT TILL/SHALE		6	SS	50/ 430mı			Mar 09 160 Filter	F							0					
	COMPLEX: trace sand, trace gravel, weathered shale, reddish brown, hard							-Slotte 159	ļ .												
158.7 158:4	SHALE BEDROCK: weathered, reddish brown	17/1	7	SS	50/			-Bento	l nite												
	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water level Reading: Date: Water Level (mbgs): Mar 9, 2021 4.24																				





DRILLING DATA



PROJECT: Geotechnical, Hydrogeology Investigation and Phase Two ESA

CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATLIM: Geodetic

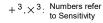
Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-01-2021 ENCL NO:

	M: Geodetic								Date:	Mar-	01-202	1					Εľ	NCL N	O.:		
BORE	HOLE LOCATION: See Drawing 1 N SOIL PROFILE	48104	1	52 E 5			Т		DYNA	MIC CO	ONE PEI	NETRA	ATION		I				Г		
(m)		ТО.				VATER	2		2	!0 4	10 60	0 8	30	100	PLAST LIMIT W _P	TIC MOI	TURAL STURE NTENT W	LIQUID LIMIT W.	r PEN.	UNIT WT	METHAN AND GRAIN SIZ
ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER		ELEVATION	0 U ● Q	NCONF UICK T	RENGT FINED RIAXIAL 10 60	+ - ×	FIÉLD & Sens LAB	VANE litivity VANE 100	WA	TER C	ONTEN	LIQUID W _L ————————————————————————————————————	POCKE (Cu) (k	NATURAL (kN/n	DISTRIBUT (%) GR SA SI
0.2	TOPSOIL: 170mm CLAYEY SILT: sandy, trace gravel, brown, moist, soft		1	ss	3	¥	X-(Ceme	nt E								0				
0.8	(weathered) CLAYEY SILT TILL: sandy, trace gravel, brown, very stiff		2	SS	28	ı		161								0					
			3	SS	25		-E	Bento	nite								0				
2.1	CLAYEY SILT TILL/SHALE COMPLEX: trace clay, trace gravel, reddish brown, moist, hard		4	SS	50/ \$00m	9		160							0	,					
58.9 3.1	SHALE BEDROCK: weathered, reddish brown		5	SS	54			159													
								/lar_01	158.6 , <u>202</u> H d Pipe												
57.1									[']												
	1) 50mm dia. monitoring well installed upon completion. 2) Auger refusal at 4.9 mbgs. 3) Water level Reading: Date: Water Level (mbgl): March 1, 2021 3.4																				







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-01-2021 ENCL NO.:

	M: Geodetic							Date:	Mar-	01-202	1					EN	ICL N	O.:		
BORE	HOLE LOCATION: See Drawing 1 N 4 SOIL PROFILE	18102	_	42 E 5 SAMPL			l .	DYNA	MIC CO	NE PE E PLOT	NETRA	TION								
(m) ELEV		PLOT				GROUND WATER CONDITIONS	NO NO	2	!0 4	PLOT 0 6 RENG	0 8 TH (kF	0 1 Pa)	00	PLAST LIMIT W _P	IC NAT MOIS CON	URAL STURE ITENT W	LIQUID LIMIT W _L T (%)	KET PEN.) (KPa)	AL UNIT WT N/m³)	METHANI AND GRAIN SIZ DISTRIBUTI
159.5	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND	ELEVATION	O UI ● Q	NCONF UICK T		+ - ×	FIÉLD \ & Sensit LAB V	ANE ivity ANE 00	WA		ONTEN	T (%)	Poc.	NATURA (KI	(%) GR SA SI
0.3	TOPSOIL: 280mm CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown		1	ss	3		Ceme 159									0				
0.8	to red, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	18		-Bento	E E							0					
	brown to red, moist to wet, stiff to hard		3	SS	29		TOO	- - -							0					
			4	SS	43		157								0					
			5	SS	50/ 480mr		W. L. Mar 0	- 156.4 1, 2021	m 						0					
					1001111		1	F d Pipe												
54.9 5 4.8 4.7	SHALE BEDROCK: weathered, reddish brown		<u>(</u>	ES_	50/ 20mr		155													
	Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water level Reading: Date: Water Level (mbgl): March 1, 2021 3.1																			



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

Method: Solid Stem Auger

DRILLING DATA

Diameter: 150mm REF. NO.: 19-323-100

BORE	SOIL PROFILE		S	AMPL	ES	Π			DYN	AMIC (CONE P	ENET	RATIC	N			TUDA:				NACTALA.
						GROUND WATER			KES	20		' —≥ 60	80	100	PLAS [*] LIMIT	TIC MO	TURAL ISTURE INTENT	LIQUID LIMIT	POCKET PEN. (Cu) (kPa)	TW TI	METHAN AND
m)		STRATA PLOT			SNE	×	SNC	N	SHE		TRENC	TH	∟ (kPa)		W _P	CC	W	\mathbf{W}_{L}	(kPa)	VL UN	GRAIN SIZ
PTH	DESCRIPTION	TA F	NUMBER		BLOWS 0.3 m	NS.		ELEVATION	0	UNCO	NFINED		È FIÉL + &S∈	D VANE nsitivity	\ _	TED	ONTEN	T (0/)	OC,	XTURA (R)	DISTRIBUT (%)
56.7		STR/	MON	TYPE	ż	GRO	NOS	ELE)	•	QUICK 20	TRIAXIA 40	AL : 60	≺ LAE 80	VANE 100	VV F	10	ONTEN 20 :	1 (%) 30		≥	GR SA SI
56.7 5 9.9 0.2	TOPSOIL: 150mm	177				Ø		-Ceme	I— ent	+		1									OR OA OI
0.2	CLAYEY SILT: trace gravel, trace organics, brown to red, moist, firm		1	SS	7				Ē												
55.9 0.8	_(weathered)					ı		156	}										1		
0.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/ boulder,	11	2	SS	25				Ė							0					
	brown, moist, very stiff to hard					H			Ē												
			3	SS	31			155	; 							0			1		
						ı			Ė												
			4	SS	47	ı			E												
			-			ı		154	E										1		
		l//	5	SS	43			-Bento	L onite							0					
						H		153	,Ē												
								155	<u>'</u>												
									Ē												
	disturbed at 4.6m					ı		152	, <u>E</u>												
			6	SS d	isturb	€			Ē							•					
	grey at 5 m					ı			Ē												
								151	ŧ_										-		
50.6		rl/							Ė												
6.1	SILTY CLAY TILL: sandy, occasional cobbles/boulder, grey,		7	SS	21				Ē							0					
	moist, very stiff						Z ∴	150 W. L.	E) m									-		
40.4]:[Feb 2	5, 20	21											
7.3	CLAYEY SILT TILL/SHALE						→ : ı	-Slotte	F												
	COMPLEX: trace gravel, trace sand, weathered shale, reddish		8	SS ,	50/	╟┠]:	149	Ē	+					 				1		
48.5	brown, hard		٥	<u>ی</u> دد	300mr	h : [<u> </u>												
8.2	END OFBOREHOLE: Notes:																				
	Auger Refusal at 8.1m probably due to shale bedrock.																				
	50mm dia. monitoring well installed upon completion.																				
	3) Water level Reading:																				
	Date: Water Level (mbgl):																				
	Feb. 25, 2021 6.7																				
						1			1										1		
			!										- 1			1					





CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

	ECT LOCATION: 3069 Dundas St W, C	akvii	iie, C	Ν						50mm							EF. NC		9-323	i-100
	M: Geodetic							Date	: Feb-	25-202	1					EN	NCL N	O.:		
BORE	HOLE LOCATION: See Drawing 1 N 4	8097				.743	1	DYNA	AMIC CO	ONE PEI	NETR/	ATION								
(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	NUMBER	LYPE TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE o L	20 4 AR ST INCONF QUICK T	PE PEI PLOT 10 60 RENGT FINED RIAXIAL 10 60	ΣΗ (kl + . ×	Pa) FIELD V & Sensiti	ANE vity	l	CON TER CO	ITENT W O ONTEN	LIQUID LIMIT W _L T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHAN AND GRAIN SIZ DISTRIBUT (%) GR SA SI
50.0	TOPSOIL: 150mm	317/	_			N K	Ceme	I—— ent	+											011 071 01
151.8	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist, soft (weathered)		1	SS	3		-Bento	F								0				
8.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobbles/ boulder, brown to red, moist, very stiff to		2	SS	27		W. L. Feb 2	151.4	m						o					
	hard		3	SS	25		Filter	‡ Pack								0				
			4	SS	39		150	Ė							0			-		
			5	SS	41		140	E							0					
							149	'E												
4.6	SILTY CLAY TILL: sandy, trace gravel, occasional cobbles/boulder, grey, moist, very stiff to hard		6	SS	29		148	3 							0					
							-Bento 147	Ponite										-		
			7	SS	19		146	<u> </u>							0					
								-												
44.4	reddish grey, shale fragments below		8	SS	80		145	; - -							0					
8.2	8 m END OF BOREHOLE: Notes: 1) Auger Refusal at 8.1m probably due to shale bedrock 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Feb. 25, 2021 1.2																			



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Feb-26-2021 ENCL NO .:

	M: Geodetic	4040	-00 -	·00 E 5	.00454	040		Date	Feb-	26-202	21					EN	ICL N	0.:		
BORE	HOLE LOCATION: See Drawing 1 N 4 SOIL PROFILE	48105	1	SAMPL				DYN/ RESI	MIC CO	ONE PE E PLOT	NETR/	ATION		D. 407	。 NAT	URAL			_	METHANE
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	ТҮРЕ	BLOWS 0.3 m	GROUND WATER	ELEVATION	SHE o U	20 4 AR ST	40 6 RENG	50 8 TH (kF	Pa) FIELD V	ANE vity	W _P	,	STURE ITENT W O ONTEN	LIQUID LIMIT W _L ——I	POCKET PEN. (Cu) (kPa)	NATURAL UNIT W (kN/m³)	AND GRAIN SIZ DISTRIBUTI (%)
164.3 16 9 .9	TOPSOIL: 150mm	1.11/2	₹	}	ż	3 5	√Cen		20 4	40 6	60 ε 	10	00	1	0 2	20 3	80			GR SA SI
63.5	CLAYEY SILT: sandy, trace gravel, trace organics, brown, wet, firm (weathered)		1	SS	5	\mathbf{x}	-Ben	tonite									0			Metals & ORPs, PA
0.8	CLAYEY SILT TILL: sandy, trace gravel, occasional cobbles/boulder, brown, moist, very stiff to hard		2	SS	26		16	3							0			-		PHCs, VO DUP05(PI
			3	SS	23										0					
			4	ss	34		:- 16 :Filte	2 r Pack -							0					
			5	SS	43		∵ W. L	ted Pipe . 161.2 09, 202	m						0					
							16	Ē.												
59.7 4.6 59.1	CLAYEY SILT TILL/SHALE COMPLEX: trace gravel, trace sand, weathered shale, reddish		6	SS	50/ 430mr		· 10							0						
	END OF BOREHOLE: Notes: 1) Auger Refusal at 5.1m probably due to shale bedrock. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgs): Mar 9, 2021 3.11																			

REF. NO.: 19-323-100

ENCL NO.:



PROJECT: Geotechnical, Hydrogeology Investigation and Phase Two ESA

CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

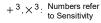
Diameter: 150mm

Date: Feb-26-2021

	SOIL PROFILE		S	AMPL	ES	· ·		DYN/ RESI	AMIC CO STANCE	ONE PE E PLOT	NETRA	ATION		PL ASTI	C .NATI	URAL	LIQUID		ΤΛ	METHANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	ER		BLOWS 0.3 m	GROUND WATER CONDITIONS	NOIL	SHE	20 4 AR STI	RENG	TH (kF	Pa) FIELD V.		PLASTI LIMIT W _P	MOIS CON	TURE TENT W	LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZE DISTRIBUTIO
164.8		STRAI	NUMBER	TYPE	<u>a</u>	GROU	ELEVATION	• 0	UICK T	RIAXIA	L ×	LAB V	ANE 00		TER CO		T (%) 30	ă -	¥.	(%) GR SA SI
16 4.6 0.2	TOPSOIL: 180mm CLAYEY SILT: sandy, trace	1 1/2	1	SS	8			-								0				PAHs
164.0	gravel, trace topsoil/rootlets, brown, moist, firm (weathered) CLAYEY SILT TILL : sandy, trace						164													Metals &
	gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	27										0					ORPs
			3	SS	24		163											_		
			4	SS	48		162								0					
			5	SS	51										0					PHCs
<u>.</u>							161													
160.0	SHALE BEDROCK: weathered.		6	SS ,	50/		160											-		VOCs
159.6 5.2	reddish brown END OF BOREHOLE:		Ť	-	880mn	<u> </u>		<u> </u>												









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

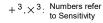
Diameter: 150mm REF. NO.: 19-323-100

Date: Feb-24-2021 ENCL NO:

	UM: Geodetic							Date:	Feb-2	24-202	1					EN	ICL N	O.:		
BOR	EHOLE LOCATION: See Drawing 1 N 4	18097	т —			.835		DYNA	MIC CC	NE PE	NETR <i>A</i>	ATION		_				_	_	
	SOIL PROFILE	1	١	SAMPL	ES.	E.R				NE PE PLOT		_		PLASTI	C NATI	JRAL TURE	LIQUID		₩	METHANE
(m)		5			SI C	GROUND WATER CONDITIONS	z			0 6			00	LIMIT W _P	CON	TENT V	LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZE
ELEV DEPTH	DESCRIPTION	ΙΑΡΙ	Ä		BLOWS 0.3 m	ND/	ΑПО		NCONF	RENG INED	IH (KF +	つる) FIELD V & Sensiti	ANE	⊢				(Cu)	(RN/	DISTRIBUTION (%)
		STRATA PLOT	NUMBER	TYPE	<u> </u>	ROU	ELEVATION			RIAXIAI	_ ×	LAB V	ANE		TER CC				₹	
153.9			z	-	-	9 0	Ш	- 2	0 4	0 6	0 0	0 1	00	'	0 2	0 3	10			GR SA SI CL
159.9	FILL: sandy silt, sand and gravel,	\bigotimes	1	SS											٥					Metals & ORPs
153.1							450													
0.8	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS			153								0					PHCs, VOCs
Ė	reddish brown, moist, very stiff																			
Ē,			3	SS			152								0					pН
² 151.8		<u> [] [}</u>					102													

DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

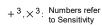
Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4809820.793 E 598							Date: Feb-24-2021 07.547									ENCL NO.:							
(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	$\overline{}$	AMPL TABLE		TER	ELEVATION	SHE	STANCI 20 4 AR ST NCONF	RENG INED RIAXIA	50 8 TH (kF + L ×	Pa) FIELD V & Sensit LAB V	00 L ZANE ivity ZANE 00		CON Y TER CO		LIQUID LIMIT W _L T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTIO (%) GR SA SI			
154.2 159.9 0.3	TOPSOIL: 280mm FILL: sand and gravel, some clay,	<u>11/4</u>		SS	=		154	_							0					Metals & ORPs			
0.8	trace cobbles, black to brown, dry to moist, loose CLAYEY SILT TILL: sandy, trace		2	ss			153	-							0								
	gravel, reddish brown, moist, very stiff		3	SS											0								
2.1 2.1	END OF BOREHOLE							-															









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

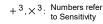
Diameter: 150mm REF. NO.: 19-323-100

Date: Feb-25-2021 ENCL NO.:

DATU	JM: Geodetic							Date:	Feb-2	25-202	1					EN	ICL N	O.:		
BORE	EHOLE LOCATION: See Drawing 1 N 4	18098	29.6	72 E 5	98797	.314														
	SOIL PROFILE				ES	 ~		DYNAI RESIS	MIC CC TANCE	NE PE PLOT	NETRA	ATIÓN		DIASTIC NATURAL LIQUID					5	METHANE
(m)		T				GROUND WATER CONDITIONS		2	0 4	0 6	0 8	30 1	00	PLASTIC NATURAL LIQUID LIMIT CONTENT LIMIT			LIMIT	POCKET PEN. (Cu) (kPa) ATURAL UNIT W	NATURAL UNIT WT (kN/m³)	AND
ELEV	DECORPTION	STRATA PLOT	_		BLOWS 0.3 m	W C	N O	SHEA	R ST	RENG	TH (kF	Pa)		W _P	V	v >	W _L	KET E	SAL U	GRAIN SIZE DISTRIBUTION
DEPTH	DESCRIPTION	ATA	BEF	ш	0.3	NO E	ΙΑ.		NCONF		+	FIELD V & Sensiti	ANE	Δ	TER CC	NITEN'	T (%)	8 2 3	ATUR *	(%)
154.1		STR	NUMBER	TYPE	þ	GRC	ELEVATION			RIAXIAI 0 6			ANE 00	l .			1 (70)		z	GR SA SI CL
150.0	TOPSOIL: 150mm	11/2					154													Metals &
0.2	CLAYEY SILT: trace sand, trace gravel, trace topsoil/rootlets, brown,		1	SS				[0				ORPs
153.3	moist, firm (weathered)																			
0.8	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS			153													PHCs, DUP04(PHCs)
E	brown, moist, very stiff	łW.																		DUPU4(PHCS)
			3	SS				Ē												
152.0	END OF PODELIOLE	11/1	Ĺ																	
2.1	END OF BOREHOLE																			
·																				
<u> </u>																				
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\Box				L													1			

DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16







CLIENT: ARGO Development Corporation

DRILLING DATA

Method: Solid Stem Auger PROJECT LOCATION: 3069 Dundas St W, Oakville, ON Diameter: 150mm REF. NO.: 19-323-100 DATUM: Geodetic Date: Feb-24-2021 ENCL NO .: BOREHOLE LOCATION: See Drawing 1 N 4809801.827 E 598789.908 DYNAMIC CONE PENETRATION RESISTANCE PLOT SAMPLES SOIL PROFILE PLASTIC NATURAL MOISTURE CONTENT METHANE GROUND WATER CONDITIONS LIQUID LIMIT POCKET PEN.
(Cu) (kPa)
NATURAL UNIT W
(kN/m³) AND 40 60 100 (m) STRATA PLOT GRAIN SIZE BLOWS 0.3 m ELEVATION SHEAR STRENGTH (kPa)

O UNCONFINED + FIELD VANE
& Sensitivity ELEV DEPTH DISTRIBUTION DESCRIPTION NUMBER (%) WATER CONTENT (%) QUICK TRIAXIAL X LAB VANE 40 60 80 10 20 30 GR SA SI CL 153.9 TOPSOIL: 180mm 15**9.**Ø 0.2 Metals & CLAYEY SILT: trace gravel, SS ORPs concrete pieces, trace topsoil/rootlets, dark brown, moist, 153 firm (weathered) 0.8 VOCs, 2 SS 0 CLAYEY SILT TILL: sandy, trace DUP03(VOCs) gravel, occasional cobble/boulder, brown, moist, very stiff 3 SS 0 152 END OF BOREHOLE



SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16

S

GRAPH NOTES



O ^{8=3%} Strain at Failure



CLIENT: ARGO Development Corporation

DATUM: Geodetic

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

Date: Feb-24-2021

DRILLING DATA

Method: Solid Stem Auger Diameter: 150mm REF. NO.: 19-323-100

ENCL NO.:

	SOIL PROFILE			SAMPL	ES	监			MIC CC TANCE					PLASTI	C NATI	URAL TURF	LIQUID	_	₩	METHANE
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O UI	LESTING STING STICK TI	0 6 RENG INED RIAXIAL 0 6	TH (kF + - ×	Pa) FIELD V & Sensitr LAB V	ANE vity	- W _P	CON V TER CO	TENT W DOMTEN	LIQUID LIMIT W _L T (%)	POCKET PEN (Cu) (kPa)	NATURAL UNIT (kN/m³)	AND GRAIN SIZE DISTRIBUTIO (%) GR SA SI (
152.1 15 2.0 0.2	TOPSOIL: 160mm	1.11/2	1	ss	10		152									0				Metals &
151.3	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist, firm (weathered)																			ORPs
0.0	CLAYEY SILT TILL: sandy, trace gravel, some sand seams, occasional cobble/boulder, brown,		2	SS	23		151									-				PAHs
	moist, very stiff to hard		3	SS	34		150								o					PHCs, DUP01(PH
			4	SS	40		130								0					VOCs, DUP02(VO
			5	ss	42		149								o			-		
							148													
	grey below 4.6m		6	SS	40										0					
							147											-		
			7	SS	36		146								0			-		
6.7	END OF BOREHOLE:	11			30															



GRAPH NOTES

+ ³, × ³: Numbers refer to Sensitivity

O ^{8=3%} Strain at Failure



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

	M: Geodetic HOLE LOCATION: See Drawing 1 N 4	8096!	53 49	92 F 5	98738	306			Date:	Feb	-24-20	21					ΕN	NCL N	0.:		
DOTAL	SOIL PROFILE			SAMPL					DYNA	MIC C	ONE P E PLO	ENETF	RATIC >	N .	PLAST	TIC NAT	URAL	LIQUID		ΤW	METHANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER	CONDITIONS	ELEVATION	SHE/	AR ST NCON UICK	RENC FINED	STH (I + AL ×	FIEL & Se	D VANE nsitivity 3 VANE 100	W _P ⊢	TER C	ITENT W O ONTEN	W _L W _L IT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT (RN/m³)	AND GRAIN SIZ DISTRIBUTIO (%) GR SA SI
15 2.9	TOPSOIL: 150mm CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist,		1	SS	8	M		Ceme	L							0					Metals & ORPs, PAI
151.6 1 0.8	firm (weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobbles/boulder,		2	SS	32											0					
	brown, moist, very stiff to hard		3	SS	31			151								o					рН
			4	SS	36			150								0					PHCs, VO
			5	SS	48			Bento	Ē							٥					
			3		40			149													
	grey below 4.6m					<u> </u>			148.0 9, 202										-		
	,		6	SS	31			viai 03	, 202 - -							o					
146.3								147	-												
6.1	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, occasional cobbles/boulder, grey, moist, very stiff to hard		7	SS	23			146								0					
	mod, for fam to hard							Filter													
<u>.</u>			8	SS	30			Slotte	d Pipe							0					
								144	-												
142.7			9	SS	35	J	1	Bento	F nite							•					
9.7	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water level Reading: Date: Water Level (mbgs): Mar 9, 2021 4.44	<i>X</i>																			





CLIENT: ARGO Development Corporation

DATUM: Geodetic

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

Date: Feb-24-2021

DRILLING DATA Method: Solid Stem Auger

Diameter: 150mm

REF. NO.: 19-323-100

ENCL NO.:

BORI	EHOLE LOCATION: See Drawing 1 N 480	9786.	.472 E 598	8802.8	335												
	SOIL PROFILE		SAMPLE	S	~		DYNAMIC RESISTAN			RATIO		PLASTIC	NATURAL	LIQUID		П	METHANE
(m)	H	? 		NS E	WATER	N O	20 SHEAR S	40 STREN	60 IGTH	80 (kPa)	100	LIMIT W _P	MOISTURE CONTENT W	LIMIT W	T PEN. (Pa)	ıL UNIT M	AND GRAIN SIZE

		SOIL PROFILE		S	AMPL	ES	_		DYNAI RESIS	MIC CO	NE PE PLOT	NETR/	ATION		PLASTI		URAL	LIQUID		WT	METHANE
Ī	(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	0 UI	I STI NCONF JICK T	RENG RENG INED RIAXIAI	TH (kF + - ×	Pa) FIELD V. & Sensitr LAB V.	vity	LIMIT W _P ⊢ WA	TER CO		LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT (kN/m³)	AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	15 9.0	ASPHALT: 150mm FILL: sandy silt, sand and gravel, trace asphalt, trace cobbles, black	\bigotimes	1	SS											С					Metals & ORPs
	153.1 1 0.8	to red, moist (weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, reddish brown, moist, very stiff		2	SS			153								0					PHCs, VOCs
	- -151.8			3	SS			152								0					pH
	2.1	END OF BOREHOLE																			









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Feb-24-2021 ENCL NO.:

	M: Geodetic HOLE LOCATION: See Drawing 1 N 4	8098	320.7	93 E 5	98807	.547			Feb-2									O.:		
BOILE	SOIL PROFILE	0000		SAMPL				DYNA RESIS	MIC CC	NE PE	NETRA	ATION			NATI	IRAI			_	METHAN
(m)		F				GROUND WATER CONDITIONS			0 4			0 10	00	PLASTIC LIMIT	CON	TURE TENT	LIQUID LIMIT W _L T (%)	PEN.	W TINI	AND
ELEV	DESCRIPTION	STRATA PLOT	<u>~</u>		BLOWS 0.3 m	W OI	ELEVATION		R STF		TH (kF	Pa)	ANF	W _P ⊢	V	v 	W _L	CKET	RAL U	GRAIN SIZ
EPTH	BEGGIIII FIGIT	RAT/	NUMBER	TYPE		NO LI	EVA-		NCONF		+ - ×	FIELD VA & Sensitive LAB VA	ity ANE	WAT	ER CC	NTEN	Γ(%)	80	NATU	(%)
54.2	TORON OO		Į₹	≱	þ	R S			0 4	0 6	0 8	0 10	00	1	0 2	0 3	0			GR SA SI
59:9 0.3	TOPSOIL: 280mm FILL: sand and gravel, some clay	<u>131.7</u> ;	1	SS			154								0					Metals & ORPs
53.4	FILL: sand and gravel, some clay, trace cobbles, black to brown, dry to moist, loose	\Diamond	├																	01413
8.0	CLAYEY SILT TILL : sandy, trace		2	SS			153								0					
	gravel, reddish brown, moist, very stiff		\vdash				155													
			3	ss											0					
52.1 2.1	END OF BOREHOLE	[][]																		
- 1																				
				I	1	I	1		1								1	1		
						l														









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

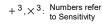
Diameter: 150mm REF. NO.: 19-323-100

Date: Feb-25-2021 ENCL NO.:

DA	ATUM: Geodetic							Date:	Feb-2	25-202	1					EN	ICL N	D.:		
ВО	REHOLE LOCATION: See Drawing 1 N 4	8098	29.6	72 E 5	98797.	.314														
L	SOIL PROFILE		_ s	AMPL	.ES	ا س		DYNAI RESIS	MIC CC TANCE	NE PE PLOT	NETRA	ATION		ום אפדי	c NATI	URAL	LIQUID		Ļ	METHANE
(m)		T				GROUND WATER CONDITIONS		2	0 4	0 6	0 8	0 1	00	PLASTI LIMIT	MOIS CON	TURE TENT	LIMIT	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND
ELE	2/	STRATA PLOT	_		BLOWS 0.3 m	W C	N O	SHEA	R ST	RENG	TH (kF	Pa)		W _P	V	v >	W _L	KET E	VAL U	GRAIN SIZE DISTRIBUTION
DEP.	TH DESCRIPTION	ATA	BE	ш	<u>BLC</u> 0.3	NO E	\AT		CONF		+	FIELD V. & Sensiti	ANE	WΔ	ER CC	NITEN:	T (%)	8 일 진	ATUR ((%)
154	1.1	STR	NUMBER	TYPE	ž	GRC	ELEVATION			riaxial 0 6			ANE 00	l .			80		z	GR SA SI CL
154	TOPSOIL: 150mm	11/2					154													Metals &
ŧ۷	CLAYEY SILT: trace sand, trace gravel, trace topsoil/rootlets, brown,		1	SS												0				ORPs
153	moist firm (weathered)																			
F ⁰	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS			153													PHCs,
F	brown, moist, very stiff	W																		DUP04(PHCs)
Ė			3	SS				-							0					
⁻² 152		111	ŭ	00											Ŭ					
2	2.1 END OF BOREHOLE																			
,																				
5																				
3																				
3																				
il i																				
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DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16







CLIENT: ARGO Development Corporation

DRILLING DATA

Method: Solid Stem Auger PROJECT LOCATION: 3069 Dundas St W, Oakville, ON Diameter: 150mm REF. NO.: 19-323-100 DATUM: Geodetic Date: Feb-24-2021 ENCL NO .: BOREHOLE LOCATION: See Drawing 1 N 4809801.827 E 598789.908 DYNAMIC CONE PENETRATION RESISTANCE PLOT SAMPLES SOIL PROFILE PLASTIC NATURAL MOISTURE CONTENT METHANE GROUND WATER CONDITIONS LIQUID LIMIT POCKET PEN.
(Cu) (kPa)
NATURAL UNIT W
(kN/m³) AND 40 60 100 (m) STRATA PLOT GRAIN SIZE BLOWS 0.3 m ELEVATION SHEAR STRENGTH (kPa)

O UNCONFINED + FIELD VANE
& Sensitivity ELEV DEPTH DISTRIBUTION DESCRIPTION NUMBER (%) WATER CONTENT (%) QUICK TRIAXIAL X LAB VANE 40 60 80 10 20 30 GR SA SI CL 153.9 TOPSOIL: 180mm 15**9.**Ø 0.2 Metals & CLAYEY SILT: trace gravel, SS ORPs concrete pieces, trace topsoil/rootlets, dark brown, moist, 153 firm (weathered) 0.8 VOCs, 2 SS 0 CLAYEY SILT TILL: sandy, trace DUP03(VOCs) gravel, occasional cobble/boulder, brown, moist, very stiff 3 SS 0 152 END OF BOREHOLE



SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16

S

GRAPH NOTES



O ^{8=3%} Strain at Failure



CLIENT: ARGO Development Corporation

DATUM: Geodetic

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

Date: Feb-24-2021

DRILLING DATA

Method: Solid Stem Auger Diameter: 150mm REF. NO.: 19-323-100

ENCL NO.:

	SOIL PROFILE			SAMPL	ES	监			MIC CC TANCE					PLASTI	C NATI	URAL TURF	LIQUID	_	₩	METHANE
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O UI	LESTING STING STICK TI	0 6 RENG INED RIAXIAL 0 6	TH (kF + - ×	Pa) FIELD V & Sensitr LAB V	ANE vity	- W _P	CON V TER CO	TENT W DOMTEN	LIQUID LIMIT W _L T (%)	POCKET PEN (Cu) (kPa)	NATURAL UNIT (kN/m³)	AND GRAIN SIZE DISTRIBUTIO (%) GR SA SI (
152.1 15 2.0 0.2	TOPSOIL: 160mm	1.11/2	1	ss	10		152									0				Metals &
151.3	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist, firm (weathered)																			ORPs
0.0	CLAYEY SILT TILL: sandy, trace gravel, some sand seams, occasional cobble/boulder, brown,		2	SS	23		151									-				PAHs
	moist, very stiff to hard		3	SS	34		150								o					PHCs, DUP01(PH
			4	SS	40		130								0					VOCs, DUP02(VO
			5	ss	42		149								o			-		
							148													
	grey below 4.6m		6	SS	40										0					
							147											-		
			7	SS	36		146								0			-		
6.7	END OF BOREHOLE:	11			30															



GRAPH NOTES

+ ³, × ³: Numbers refer to Sensitivity

O ^{8=3%} Strain at Failure



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

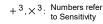
Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-01-2021 ENCL NO.:

DA	TUM: Geodetic							Date:	Apr-0)1-202	1					ΕN	NCL N	O.:		
ВО	REHOLE LOCATION: See Drawing 1 N 4	8105	12.7	09 E 5	98060	.437														
	SOIL PROFILE		8	SAMPL	.ES			DYNA RESIS	MIC CO	ONE PE E PLOT	NETRA	ATION		DI ACTI	C NAT	URAL	LIQUID		Ŀ	METHANE
(m)		T				GROUND WATER CONDITIONS		2	0 4	10 6	0 8	30 1	00	LIMIT	MOIS CON	TURE TENT	LIMIT	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND
ELE	v	STRATA PLOT	_		BLOWS 0.3 m	W C	Z O	SHEA	R STI	RENG	TH (ki	Pa)		W _P		w 0	WL	KET E	SAL U	GRAIN SIZE DISTRIBUTION
DEP1	DESCRIPTION	ATA	NUMBER	ш	0.3	NO	ELEVATION		NCONF		+	FIELD V. & Sensiti	ANE vity	WA	TER CO	ONTEN	T (%)	9 0 0	ATUF.	(%)
162	4	STR	N S	TYPE	ż	GRC	E.E.						OO				30			GR SA SI CL
169		117																		
٤°	CLAYEY SILT: trace sand, trace gravel, trace topsoil/rootlets, brown,		1	SS	4		162								-		<u> </u>	-		
161	moist, firm (weathered)																			
E	.8 CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	21										0					
Ė	brown, moist, very stiff to hard		\vdash				161													
Ė			3	SS	30										0					
-2		ŊŊ	Ĺ																	
Ē			╆			-	160													
E		YK	4	SS	35										0					
<u>³</u> 159			Ļ	00	50/															
F 3	 .1 SHALE BEDROCK: reddish brown, weathered 		5	SS_	50/ 20mm	4	159													
E																				
4																				
F							158													
157				CSS	55/														Ш	
4	.8 END OF BOREHOLE: Notes:				75mm	1														
	Borehole dry upon completion.																			
,																				
:																				
il																				
ıl .																				
																			Ш	

DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-01-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES] _~		DYNAI RESIS	MIC CC TANCE	NE PE E PLOT	NETRA	TION		PLASTIC	, NATI	JRAL	רוטווע		WT	ME	ΓHANE
(m)		PLOT			WS m	GROUND WATER CONDITIONS	NO		0 4 AR STI	0 6 RENG	TH (kF	Pa)		LIMIT W _P	MOIS CON	TENT	LIQUID LIMIT W _L	KET PEN.) (kPa)	NATURAL UNIT W (KN/m³)	GRA	ND IN SIZE IBUTIO
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	SROUND	ELEVATION	0 UI	NCONF		+ - ×	FIELD VA & Sensitiv	ANE	WAT		NTEN ⁻	Γ (%)	POC.	NATUR. (k		(%) A SI (
164.6 16 9.9 0.2	TOPSOIL: 150mm CLAYEY SILT: trace sand, trace		1	SS	4		ш						-		0		44			GIV 37	. 51
163.8 1 0.8	topsoil/rootlets, trace gravel, brown, moist, firm (weathered) CLAYEY SILT TILL: sandy, trace						164														
	gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	22		163							0							
2			3	SS	23										0						
			4	SS	33		162								0						
3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1	SILTY CLAY TILL: some sand, trace gravel, occasional		5	SS	30										∘ ⊩					5 16	6 46 3
4	cobble/boulder, grey, moist, hard		Ľ			_	161										•			0 10	, 10 (
160.3 4.3 159.9	CLAYEY SILT TILL/SHALE COMPLEX: trace sand, trace						160														
4.7	gravel, reddish brown, moist, hard SHALE BEDROCK: reddish brown, weathered		6	SS	50/ 75mm																
159.0	END OF BOREHOLE:		7	- SS .	56/		150														
	1) Borehole open and dry upon completion.																				



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

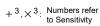
DRILLING DATA Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

BOREI	HOLE LOCATION: See Drawing 1 N 4	8105	т —			544 T		DYNA	AMIC CO	ONE PF	NETR/	ATION					1		
(m) ELEV EPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	NUMBER	SAMPL 14 be	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE.	STANCI 20 4 AR ST INCONF QUICK T	E PLOT 40 6 RENG FINED RIAXIA	50 8 TH (ki	Pa) FIELD \ & Sensit	IOO I /ANE tivity	TER CO		LIQUID LIMIT W _L IT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZ DISTRIBUTIO (%)
16 4.4 16 4.0 0.2	TOPSOIL: 150mm CLAYEY SILT: trace sand, trace	1.17.	1	SS	5		164								0				OK OA OI
163.6	topsoil/rootlets, trace gravel, brown, _moist, firm (weathered)						104							0					
	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/ boulder, brown, moist, very stiff to hard		2	SS	18		163							0					
			3	SS	25									o					
			4	SS	35	_	162							0					
			5	SS	33	-	161							0					
							160												
59.8 4.6	CLAYEY SILT TILL/SHALE COMPLEX: trace sand, trace		6	SS	56/ 75mm									•					
58.9	gravel, occasional cobble/ boulder, reddish brown, moist, hard		7	SS	61/		159										-		
5 8. 8	SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE:		7	33	61/ \00mr	•													









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

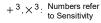
Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-01-2021 ENCL NO.:

	SOIL PROFILE		5	SAMPL	ES	ir.		DYNA RESI	MIC CO STANCE	NE PE E PLOT	NETRA	ATION		PLASTI	C NATI	URAL TURE	LIQUID LIMIT		WT	METHANI
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE.	AR STI NCONF UICK T	RENGTINED RIAXIAL	TH (kF + - ×	FIELD VA & Sensitiv	ANE vity ANE	LIMIT W _P ⊢— WA	TER CO	TENT W DOMTEN	W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZ DISTRIBUT (%) GR SA SI
16 9.0 0.2	TOPSOIL: 150mm CLAYEY SILT: trace sand, trace gravel, trace topspoil/rootlets,		1	SS	3		162								c	(
0.8	brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	16										0					
	blown, moist, very sun to hard		3	SS	28		161								0					
			4	SS	40	-	160								0			_		
	grey below 3.1m		5	SS	31		159								o					
58.0 5 4.6	CLAYEY SILT TILL/SHALE		6	SS	91		158							0				-		
4.8	COMPLEX:: trace sand, trace gravel, reddish brown, moist, hard SHALE BEDROCK: reddish brown, weathered						157											-		
56.4	END OF BOREHOLE:		7	00	F2/															
	Borehole bottom wet upon completion.																			







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

ENCL NO.:

Date: Mar-31-2021

	SOIL PROFILE		8	SAMPL	98126 .ES	_		DYNA RESI	MIC CO	NE PE PLOT	NETR/	ATION		DI ACTI	o NATI	JRAL	LIOLID		F	METHAN
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	ТҮРЕ	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE	AR STI	0 6 RENG INED RIAXIA	TH (kF + L ×	0 10 Pa) FIELD V & Sensitiv LAB V	ANE vity ANE		TER CO	v DMTEN	. ,	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	
164.1	TOPSOIL: 250mm	ν / 1/γ.	z	Ĺ	F	00	164		20 4	0 6	8 08	0 10	00	1	0 2	0 :	30	-		GR SA SI
16 9 : 9	CLAYEY SILT: trace sand, trace		1	ss	5		104	-								0				
163.3	gravel, trace topsoil/rootlets, brown, moist, firm (weathered) CLAYEY SILT TILL: sandy, trace		1																	
	gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	21	<u> </u>	163								0					
			3	SS	27		162								0					
			4	SS	27										0					
			5	SS	26		161	<u> </u>							0					
							160	-												
159.4			_				100													
4.7	SHALE BEDROCK: reddish brown, weathered		6	SS	57/ 100mn	 	159													
157.8			7	SS	60/	-	158	F										1		
	Notes: 1) Water at 4.7m during drilling.																			



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-31-2021 ENCL NO.:

BORE	HOLE LOCATION: See Drawing 1 N 4	8105				721		D) (A) A	110.00	NE DE	NETO	ATION									
	SOIL PROFILE			SAMPL	.ES	<u>_</u>		RESIS	TANCE	NE PE E PLOT	NETR/	A HON		PLAST	C NAT	URAL	LIQUID		₽	MET	HANE
(m)		15				GROUND WATER CONDITIONS		2	0 4	0 6	i0 ε	30 1	00	LIMIT	CON	URAL TURE TENT	LIQUID LIMIT	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	A	ND N SIZE
ELEV	DESCRIPTION	PL(<u>س</u>		BLOWS 0.3 m	N O	NO!			RENG	TH (ki	Pa)	ANE	W _P	\	v >	W _L	는 문학	KN/W	DISTR	BUTION
DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	М		N E	ELEVATION		NCONF	INED RIAXIA	+ ı ×	FIELD V & Sensit	ivity ANF	WA ⁻	TER CO	ONTEN	T (%)	§0	MTA □	(%)
164.6		STF	Ž	TYPE	ż	GR O	ä			0 6			00	1	0 2	20 3	30				SI CL
16 0.0	TOPSOIL: 150mm		1	SS	3											0					
<u> </u>	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist,		1_	- 55			164														
163.8 1 0.8	soft (weathered) CLAYEY SILT TILL: sandy, trace		╀			1	10-1														
	gravel, occasional cobble/boulder,	KK.	2	SS	22			Ē							0						
-	brown, moist, very stiff to hard		F				163														
2			3	SS	29		100								o						
			\vdash					F													
-			4	SS	40		162	<u> </u>													
-3			Ĺ				102														
Ē			╁			1		-													
-			5	SS	20		161								∘⊢	\vdash				7 21	48 24
L			\vdash			1	101														
Ė			1					-													
160.0							160														
4.6	SILTY CLAY TILL: sandy, trace gravel, occasional cobble/boulder,		6	SS	27		100								0						
Ě	greyish brown, moist, very stiff		1					-													
-			1				159														
64.50.5			1				100														
158.5 15 8.4	SHALE BEDROCK: reddish	161	7	SS ,	62/									-							
6.2	brown, weathered END OF BOREHOLE:				76mm																
	Notes:																				
	Borehole bottom wet upon completion.																				
			1																		
			1																		
			1																		
1												1	1		1	1	Í.				

DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-01-2021 ENCL NO.:

	SOIL PROFILE		S	SAMPL	ES			DYN/ RESI	AMIC CO STANCE	ONE PE PLOT	NETR/	ATION			NATI	URAI		\prod	-	METHAN
(m)		 -				GROUND WATER CONDITIONS		l		10 6		30 10	00	PLASTI LIMIT	C MOIS	TURE TENT	LIQUID LIMIT W _L ————————————————————————————————————		M ⊨	AND
(m)		STRATA PLOT			BLOWS 0.3 m	WAN	z							W _P		N	\mathbf{W}_{L}	(KPa)	N E	GRAIN SI
LEV EPTH	DESCRIPTION	ΑP	监		0.5	일은	ELEVATION		AR ST	INFD	ı⊓ (Kı +	FIELD V	ANE			·		S S	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	DISTRIBUT
		₹	MBE	Щ		3 <u>9</u>	<u>*</u>		QUICK T	RIAXIAL	_ ×	& Sensitiv	vity ANE	WAT	ER CO	ONTEN	IT (%)	180	¥	(%)
61.2		STF	NUMBER	TYPE	ż	GR	ä			0 6		0 10		1	0 2	20 :	30			GR SA SI
60.0 0.2	TOPSOIL: 150mm	17/2					161	-												
0.2	CLAYEY SILT: trace sand, trace		1	SS	5		101	-							,		0			
60.4	gravel, trace topsoil/rootlets, fill mixed with organics, dark grey,		\vdash			ł		Ē												
0.8	moist, firm (weathered)	7	1			1		F												
	CLAYEY SILT TILL: sandy, trace	ИИ	2	SS	10		160	<u> </u>							0			4		
	gravel, grey, moist, stiff to hard							Ē												
		<i>H</i> it	3	SS	35			Ė							0					
			Ľ					E												
		[14]					159	<u> </u>										┨		
			4	SS	19			Ė												
			Ĺ					F							-					
58.1	CLAYEY SILT TILL/SHALE		\vdash					-												
3.1	COMPLEX: trace sand, trace	19/	5	SS	52/		158	E						0				1		
	gravel, reddish brown, moist, hard				125mr	1		ļ.												
			1					F												
			1				157													
56.6							107	Ė												
4.6	SHALE BEDROCK: reddish	77.73	6	SS	55/	1		Ŀ												
	brown, weathered				75mm			E												
			1				156	-										1		
								Ė												
			1					Ė											1	
55.0			_	22	EE/			<u> </u>											L	<u></u>
6.2	END OF BOREHOLE:		<u> </u>		25mm															
	Notes: 1) Borehole open and wet upon																			
	completion.																			
		1						l												
								l				1							1	



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

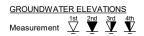
Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

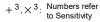
ENCL NO.:

Date: Mar-31-2021

S	DIL PROFILE		5	SAMPL	.ES	<u>«</u>		DYNA RESIS	MIC CO STANCE	ONE PE E PLOT	NETRA	ATION		PLASTI	C NATI	URAL	LIQUID		ΛΤ	METHA	
(m) LEV EPTH [DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE/	AR STI NCONF UICK T	RENG INED RIAXIA	TH (kF + L ×	FIÉLD V. & Sensiti	ANE vity ANE	W _P WA	TER CO	w ONTEN	LIQUID LIMIT W _L ——I T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	ANI GRAIN DISTRIBI (%)	SIZE UTIO)
60.0 TOPSOIL:	180mm ILT: sandy, trace gravel, oil/rootlets, brown, moist,		1	SS	4		163									0	0				
0.8 Soft (weath	ered) ILT TILL: sandy, trace asional cobble/boulder,		2	SS	15										0						
brown, mo	ist, very stiff		3	SS	29		162								0						
61.2 2.3 SILTY CL	Y TILL: sandy, trace						404														
gravel, gre	yish brown, moist, hard		4	SS	34		161								∘ ⊩					5 22 4	49
			5	SS	35		160								0						
4.7 SHALE B brown, we	EDROCK: reddish		6	SS	61/ 127mn	 m	159														
						=	158	-													
57.3				00	00/			Ę													









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Date: Mar-31-2021

Method: Solid Stem Auger

Diameter: 150mm

ENCL NO.:

REF. NO.: 19-323-100

	SOIL PROFILE		S	SAMPL	ES	l		DYN. RES	AMIC CO	ONE PEN E PLOT	NETRA	ATION				URAL			F	METHAN
(100)		 -				GROUND WATER CONDITIONS		l		10 60		30 10	00	PLASTI LIMIT	CON MOIS	TURE	LIQUID LIMIT W _L ——I	Ä,	W TI	AND
(m)		STRATA PLOT			BLOWS 0.3 m	WA	Z		AR ST		TH (kE	 		W _P	١	N.	\mathbf{W}_{L}	ET P	L UN	GRAIN SIZ
LEV EPTH	DESCRIPTION	Ι¥	ËR		0.3	₽ E	F		JNCONF		+	FIELD VA & Sensitiv	ANE	-		>		ξĝ	(RA	DISTRIBUT
		[₹	NUMBER	TYPE			ELEVATION	• (QUICK T		. ×	LAB VA	NE		TER CO	ONTEN	IT (%)	l -	¥	(%)
63.2			ž	Ĺ	ż	<u>5</u> 5			20 4	10 60) 8	0 10	00	1	0 2	20 3	30			GR SA SI
6 2 . 9	TOPSOIL:230mm CLAYEY SILT: trace sand, trace	111 111	1	SS	3		163	F						0						
	gravel, trace topsoil/rootlets, grey,				_			E												
0.8	moist, soft (weathered)		\vdash			1		E												
0.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/ boulder,		2	SS	17		162	<u> </u>							0			-		
	grey, moist, very stiff to hard							E												
		Hit	3	SS	24			E							0					
		nh	Ĺ				161	Ē												
		134	\vdash			1	101	Ė												
		141	4	SS	34			E							0					
		rk!	\vdash			-		F												
		ИN				1	160	F-										1		
			5	SS	28			-							0					
								E												
			1				159	_										-		
58.6			1					-												
4.6	SHALE BEDROCK: reddish brown, weathered	1 2	6	\SS_	61/	1		Ē												
	weathered				1 <u>00m</u> r	1	158	-												
							'00	Ė												
								-												
57.0							l	Ė												
6.2	END OF BOREHOLE:		7	SS	63/ 50mm		157													



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-01-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES.	<u>_</u>		DYN/ RESI	AMIC CO STANCI	ONE PE	NETRA	ATION		DI ASTI	C NAT	URAL	LIQUID		Τ.	MET	HANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE O L	AR ST JNCONF QUICK T	RENG FINED RIAXIAI	TH (kF	FIELD V & Sensiti LAB V	ANE vity	W _P	CON V TER CO	TENT W O ONTEN	LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (KN/m³)	GRAI DISTR	%)
161.8 160.0 0.2	TOPSOIL:150mm	137	1	ss	2			-	f											OR OA	. 01 (
161.0	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist, very soft (weathered)			55	2		161								c	°					
0.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/ boulder, greyish brown, moist, stiff to hard		2	SS	12										0						
			3	SS	29		160								0			-			
			4	SS	48		159								0						
			5	SS	53															4 23	48
		9				!	158											-			
57.2 4.6	CLAYE SILT TILL/SHALE COMPLEX: sandy, trace gravel,		6	SS	61		157							0				-			
	occasional cobble/ boulder, reddish brown, moist, hard					-															
55.4						-	156														
6.4	SHALE BEDROCK: reddish brown, weathered	1/1/	7	SS	70		155														
54.4								Ē													
7.4	END OF BOREHOLE: Note: 1) Water at 5.2m upon completion.		8		53/ / 25mm																



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

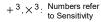
Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-31-2021 ENCL NO.:

	SOIL PROFILE		s	AMPL	ES	<u>ر</u>		DYNA RESI	MIC CO STANCE	NE PE E PLOT	NETRA	ATION		PLASTI	C NATI	URAL	LIQUID		VT	METHAN
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE.	AR STI NCONF UICK T	RENG INED RIAXIA	TH (kF + L ×	FIÉLD VA & Sensitiv	ANE vity ANE	W _P ⊢ WA1	TER CO	ITENT W O ONTEN	LIQUID LIMIT W _L ——I IT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZ DISTRIBUT (%) GR SA SI
0.2	TOPSOIL:200mm CLAYEY SILT: sandy, trace grayel.	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1	SS	3											0				
0.8	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace						164													
	gravel, occasional cobble/ boulder, greyish brown, moist, very stiff to hard		2	SS	23										0					
			3	SS	32		163								0					
	reddish brown below 1.5m		4	SS	42		162								0			=		
			5	SS	43										0					
							161													
	grey below 4.6m		6	SS	44		160								0					
158.7			1				159											1		
6.1	SANDY SILT TILL: trace clay, trace gravel, occasional cobble/ boulder, reddish brown, moist, very dense		7	SS ,	53/ 100mn	<u> </u> 	158							0						
157.2	delise																			
15 7.6	SHALE BEDROCK: reddish brown.	101	8	AS	57/		157	_										┡		
7.8	weathered END OF BOREHOLE: Note: 1) Borehole open and dry upon completion.				(1 <u>2mm</u>)															
					l												1			









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

	SOIL PROFILE		SA	MPLI	ES			DYN RES	AMIC C	ONE PE E PLOT	NETRA	ATION		DI 10-	NATI	URAL			F	METHANI
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NOMBER	TYPE	"N" <u>BLOWS</u> 0.3 m	GROUND WATER	ELEVATION		20 EAR ST UNCON QUICK	40 6 RENG	0 8 TH (kF + - ×	0 1 Pa) FIELD V & Sensiti	ANE	1	CON V TER CO		LIQUID LIMIT W _L ——I T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZ DISTRIBUTI (%) GR SA SI
160.3	TOPSOIL: 150mm CLAYEY SILT: trace sand, trace	1/2		ss	5			1								0				0.1 0.1 0.
159.7 0.8	gravel, some topsoil/rootlets, brown, moist, very soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2 :	SS	22		16	50							0					
	brown, moist, very stiff to hard			ss	26		15	59							0			_		
				SS	30	V	W. L Apr	. 158.2 14, 202 Itonite	2 m 21						0			-		
	greyish brown at 3.1m		5 :	SS	39		15	Ė							0			-		
155.9							1.5	56												
4.6	CLAYEY SILT TILL/SHALE COMPLEX: trace sand, trace gravel, occasional cobble/ boulder, reddish brown, moist, hard		3 3	SS	55/ (30mŋ									0						
54.4	SHALE BEDROCK: reddish brown,		7 \ 3	ss ,	60/		15 	55												
2.1	weathered				00mm			er Pack ted Pip												
152.8				•			15	53												
7.7	END OF BOREHOLE: Notes: 1) Borehole open and dry upon completion. 2) Water Level Readings: Date: Water Level (mbgl): April 14, 2021 2.29			(

+ 3 , \times 3 : Numbers refer to Sensitivity

O ^{8=3%} Strain at Failure



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: May-04-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES.			RESI	AMIC CO STANCE	ONE PEI E PLOT	NETR/	ATION		DI 10-	o NATI	URAL			-	METHAN
()		-				GROUND WATER CONDITIONS				10 60		30 10	00	LIMIT	IC NATI	TURE	LIQUID LIMIT W _L ——I	Ä.	W H	AND
(m)		STRATA PLOT			BLOWS 0.3 m	WA	z		AR STI	-	TH /VE	Da)		W _P		V	\mathbf{W}_{L}	(KPa	J. E.	GRAIN SI
LEV EPTH	DESCRIPTION	Ι¥	NUMBER		0.3	S E	ELEVATION		JNCONF		+	FIELD VA & Sensitiv	ANE vitv	-				ξĝ	울호	DISTRIBUT
		₹	JME	TYPE		질	EV.		QUICK T		. ×	LAB V	ANE		TER CO	ONTEN	T (%)	"	≱	(70)
60.6			ž		þ	ਹ ਹ	ш		20 4	0 60) 8	80 10	00	1	0 2	20 3	30			GR SA SI
6 0.4 0.2	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace		1	SS	3			Ē								0				
	gravel, some topsoil/rootlets, brown.	V V V I			Ů		160	<u> </u>							0					
59.8 0.8	_moist, very soft (weathered)							Ē												
0.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	18			Ē							0					
	brown, moist, very stiff to hard	łW.					4.50													
		W	3	SS	29		159								o ⊢					6 18 52
		111			23			Ė							•					0 10 02
			\square					Ė												
			4	SS	40		158	<u> </u>							0			-		
								Ė												
57.5 3.1	CLAYEY SILT TILL/SHALE		\vdash		F0/			-												
	COMPLEX: sandy, trace gravel,		5	SS	52/ 100mn		157	F							•					
	trace shale, occasional cobble/ boulder, reddish brown, moist, hard					ł	157													
	200.00., 1000.0 2.0, 110.0., 110.0		1					E												
								Ē												
55.9			6	SS	52/		156	-						0				1		
4.7	SHALE BEDROCK: reddish brown, weathered				00mr	4		-												
	Wednered							Ē												
							155													
54.4			7	00	FO/															
6.2	END OF BOREHOLE: Notes:		Γ	(00)	50mm															
	Borehole open and wet upon																			
	completion.																			
- 1		1	1		ĺ	I	1	I		1			1	1	1		1	1	1	l



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

ESA DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-30-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	.ES			DYN. RES	AMIC CO ISTANCE	ONE PE	NETRA	ATION		DI ACT	IC NATI	URAL	רוטווס	_	F	METHAN
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE o l	20 4 AR STI JNCONF QUICK T	10 6 RENG INED RIAXIAI	0 8 TH (kF + L ×	Pa) FIELD V/ & Sensitiv	ANE vity ANE	W _P WA	CON V TER CO	TURE TENT W O	LIQUID LIMIT W _L ——I T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT W (KN/m³)	AND GRAIN SI DISTRIBUT (%)
161.8 16 0.6 0.2	TOPSOIL: 200mm	31 1/2				00	ш	-	20 4	10 6	0 8	80 10	JU		0 2		30			GR SA SI
31.0	CLAYEY SILT: trace sand, trace gravel, some topsoil, brown, moist, very soft (weathered)		1	SS	3		161									0				
8.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	19										o					
	·		3	SS	31		160	-							0					
			4	SS	35	_	159								0					
	greyish brown at 3.1m		5	SS	40										∘⊩		-			3 19 47
						_	158													
57.2 5 4 .6	CLAYEY SILT TILL/SHALE				60/	-	157													
4.7	complex: trace sand, trace gravel, occasional cobble/ boulder, reddish brown, moist, hard		6	SS	100mn	<u> </u>														
55.6	SHALE BEDROCK: reddish brown, weathered						156													
	Borehole open and dry upon completion.																			



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Soli Stem Auger

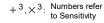
Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-30-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES	<u>بر</u>		DYN/ RESI	AMIC CO STANCE	NE PE PLOT	NETR/	ATION		PLASTI	C NATI	URAL TURE	LIQUID LIMIT		WT	METHANE
(m) ELEV EPTH 63.1	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE O U	AR STI	INED	TH (kf + - ×	Pa) FIELD V & Sensitr LAB V	ANE vity ANE 00	1	TER CO	NTENT	W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZ DISTRIBUTI (%) GR SA SI
6 2.0 0.2	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace gravel, trace topsoil/rootlets, grey,		1	SS	5		163								0	0				
0.8	moist, very soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	28		162								•			-		
	greyish brown, moist, very stiff to hard		3	SS	30										0					
			4	SS	33		161								0					
	grey below 3.1m		5	SS	47		160								0			-		
]		47		159								ŭ					
58.2					F0/		109													
4.9	SHALE BEDROCK: reddish brown, weathered		6	SS	52/ 125mn	n -	158							0						
56.9							157													









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-30-2021 ENCL NO.:

BORE	HOLE LOCATION: See Drawing 1 N 4	8103				.282		IDVN/	AMIC CO	NE DE	NETRA	TION						_		
	SOIL PROFILE		S	AMPL	.ES	ER		RESI	STANCE	E PLOT	\geq		20	PLASTI LIMIT	C NAT	URAL	LIQUID LIMIT	z	T W T	METHANE AND
(m)		STRATA PLOT			SIL	GROUND WATER CONDITIONS	z	_		10 61		0 10	00	W _P	CON	TENT W	WL	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	GRAIN SIZ
LEV EPTH	DESCRIPTION	TA P	ER		BLOWS 0.3 m	D E	ELEVATION		AR STI		IП (КГ +	FIELD V & Sensiti	ANE vity			·		(CC)	(KN	DISTRIBUT (%)
		T.A.	NUMBER	TYPE	<u> </u>	ROL	LEV,		UICK T		- ×	LAB V	ANE		TER CO		. (,,,		¥	
60.1 50.0	TOPSOIL 150mm	13 14	z	<u> </u>	-	00	Ш	<u> </u>	20 4	0 6	J 8	0 10	JU	1	0 2	20 :	30			GR SA SI
5 9.9	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist,		1	SS	8			-									0			
59.3	trace topsoil/rootlets, brown, moist, _firm (weathered)					1		-												
8.0	CLAYEY SILT TILL: sandy, trace		2	SS	22		159	<u> </u>							•					
	gravel, brown, moist, very stiff to hard		\sqsubseteq					-												
			3	SS	22			Ē							0					
			Ш				158	_												
					52/	1		Ē												
			4	SS	125mn	<u> </u>		-							0					
57.0 3.1	SANDY SILT TILL: some clay,	19	┢		50/		157	-												
	trace gravel, occasional cobble/boulder, reddish brown,		. 5	SS	58/ 75mm			-						0						
	moist, very dense					1		Ė												
							156	-												
55.5				00	70/			Ė												
5 4.6 4.7	SHALE BEDROCK: reddish brown, weathered			_ SS _	70/ 25mr															
	END OF BOREHOLE: Notes:																			
	Water at 3.7m upon completion.																			
			ı			l	1	l	1					1			1	I	I	



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

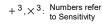
Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-30-2021 ENCL NO.:

BORE	HOLE LOCATION: See Drawing 1 N 4	8104	00.6	78 E 5	98436	.494															
	SOIL PROFILE		S	AMPL	.ES	<u>_</u>		DYNA RESIS	MIC CC TANCE	NE PE PLOT	NETRA	ATION		PLASTI	C NATI	JRAL TURE	LIQUID		L	MET	HANE
(m) ELEV	DESCRIPTION	, PLOT	œ		BLOWS 0.3 m	GROUND WATER CONDITIONS	NOL		R STI	0 6 RENG	TH (kF	 Ра)	00 ANE	LIMIT W _P ⊢—	CON	TURE TENT V	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	A GRAI DISTR	ND N SIZE IBUTION
161.0	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLO	GROUN	ELEVATION	• Q		ined Riaxial 0 6	_ ×		vity ANE 00		TER CC		T (%)) (A)	NATUL IUTAN		%) . SI CL
16 0.9 0.2	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace gravel, trace topsoil/rootlets, brown,		1	SS	5			-							0	0					
160.2 1 0.8	moist, firm (weathered) SILTY CLAY TILL: sandy, trace gravel, brown, moist, very stiff to		2	SS	26		160	-							0						
- - - - - -	hard		3	ss	25		159								0						
			4	SS	27	-	100								 • 	_				4 22	51 23
- - 3 - -					20	-	158														
_ _ _ 			5	SS	28	-	157								0						
156.3					50/	-		-													
4.7 5	SHALE BEDROCK: trace limestone, grey, weathered		6	SS	56/ 125mn	 	156	-													
- - - 154.8							155	-													
6.2	END OF BOREHOLE: Notes:		7	CE_	65/ 75mm																
	1) Borehole wet upon completion.																				

DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-05-2021 ENCL NO.:

	SOIL PROFILE		S	SAMPL	.ES			DYNA RESIS	MIC CO	ONE PEI E PLOT	NETR/	ATION			ΝΔΤΙ	IRAI			L	METHAN
()						GROUND WATER				10 60		0 10	00	PLASTI LIMIT	C MOIS	URAL TURE TENT	LIQUID LIMIT	Ä.	NATURAL UNIT WT (kN/m³)	AND
(m)		STRATA PLOT			BLOWS 0.3 m	A N	2 z		1	RENG	ΓΗ (kF	Pa)		W _P		N .	\mathbf{W}_{L}	POCKET PEN. (Cu) (kPa)	\L UN \/m³)	GRAIN S
LEV PTH	DESCRIPTION	ΑF	ER		0.3	1 E] F		NCONF		+	FIELD VA & Sensitiv	ANE	-		>		ξĝ	RA RN	DISTRIBU [*] (%)
		TRA	NUMBER	TYPE	<u> </u>	RO F	ELEVATION			RIAXIAL	. ×	LAB VA	ANE	l	TER CO			"	¥	
0.0	_TOPSOIL: 150mm	11/2	z	<u> </u>	F	O C) ш	<u> </u>	20 4	10 60) 8	0 10	10	1	0 2	20 3	30	-		GR SA SI
9.9 0.2	CLAYEY SILT: trace sand, trace		1	SS	5			ŧ								0				
59.2	gravel, some topsoil/rootlets, brown,							F							0					
0.8	moist, firm (weathered) CLAYEY SILT TILL: sandy, trace	***	•		20		15	<u> </u>										-		
	gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	22			E							0					
	brown, moist, very still to hard							Ė												
		411	3	SS	25		15	3 -							0					
		' []				∇		1												
		4111	4	SS	43	_		157.6							0					
							Apr 1	4, 202 <i>°</i> - L												
	greyish brown at 3.1m	XX					13	<u> </u>												
		111	5	SS	31			F							0					
							45	Ţ.												
							150	7												
5.4								E												
4.6	SILTY CLAY TILL: trace sand, trace gravel, greyish brown, moist,		6	SS	21			_[0					
	very stiff						15	T T							Ť			1		
						:		E												
								ŀ										1		
6.1	CLAYEY SILT TILL/SHALE				-	:目	Filter	1E Pack										1		
5.1	COMPLEX: trace sand, trace		7	SS	50/ 50mm		Slott	ed Pipe						(}					
	gravel, occasional cobble/ boulder, reddish brown, moist, hard				2011111			ŧ												
53.0 5 2.8	SHALE BEDROCK: reddish brown,	1.14.1	8 /	SS	52/		15	3										L		
7.2	weathered				25mm															
	END OF BOREHOLE: Notes:																			
	Borehole open upon completion. Water Level Readings:							1												
	Date: Water Level (mbgl): Aprl 14, 2021 2.37m																	1		
																		1		
																		1		
																		1		
																		1		
																		1		
																		1		
																		1		
																		1		
		l																		



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-30-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	.ES			DYN/ RESI	AMIC CO STANCE	NE PE PLOT	NETRA	ATION		DI 40-	NATI	URAL	1.16: "-		F	METH.	ANF
(m)		LOT			S) _	NATER NS	z					_	00	PLASTI LIMIT W _P	C NATI MOIS CON	TURE TENT	LIQUID LIMIT W _L	T PEN. KPa)	· UNIT W	AN GRAIN	D SIZE
EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	- `	AR STI JNCONF QUICK TI 20 4	RENG FINED RIAXIAL 10 6		7a) FIELD VA & Sensitiv LAB VA			TER CC	ONTEN 20 3	LIQUID LIMIT W _L ——I T (%)	POCKE (Cu)	NATURAI (KN)	DISTRIB (% GR SA)
59.9 5 0.8 0.2	TOPSOIL: 180mm	31 1/2						-							<u> </u>					GR SA	31
59.1	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, moist, firm (weathered)		1	SS	5										0	0					
8.0	SILTY CLAY TILL: sandy, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	24		159	-							0						
	·		3	SS	30		158								o ⊢					5 22	51
			4	SS	36			- - - -							0						
	greyish brown		5	SS	72/		157	-							0						
					100mn	h	156														
55.3	SHALE BEDROCK: reddish brown,																				
4.6	weathered		6	SS	92/ 100mn	 	155											_			
							154														
53.7 6.2	END OF BOREHOLE:		7	- 22	61/		154														
	1) Borehole open and dry upon completion.																				



PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

CLIENT: ARGO Development Corporation

Method: Solid Stem Auger

DRILLING DATA

Diameter: 150mm

Date: Apr-05-2021

ENCL NO.:

REF. NO.: 19-323-100

BOREHOLE LOCATION: See Drawing 1 N 4810130.712 E 598284.099 DYNAMIC CONE PENETRATION RESISTANCE PLOT SOIL PROFILE SAMPLES PLASTIC NATURAL MOISTURE CONTENT METHANE GROUND WATER CONDITIONS LIQUID LIMIT POCKET PEN. (Cu) (kPa) AND 40 60 100 NATURAL UNIT (KN/m³) (m) STRATA PLOT GRAIN SIZE BLOWS 0.3 m SHEAR STRENGTH (kPa)
O UNCONFINED + ESensitivity ELEVATION ELEV DEPTH DISTRIBUTION DESCRIPTION NUMBER (%) WATER CONTENT (%) QUICK TRIAXIAL X LAB VANE 60 80 10 20 30 158.4 GR SA SI CL TOPSOIL: 150mm SS 3 SILTY CLAY: trace sand, trace 158 gravel, some topsoil, brown, moist, 157.6 soft (weathered) 0.8 CLAYEY SILT TILL: sandy, trace 2 SS 18 0 gravel, occasional cobble/boulder, brown, moist, very stiff to hard 157 3 SS 30 156 SS 41 4 SS 39 5 155 CLAYEY SILT TILL/SHALE 50/ 6 SS COMPLEX: trace sand, trace 30mr gravel, occasional cobble/ boulder, reddish brown, moist, hard 153 SHALE BEDROCK: reddish brown, 12mm END OF BOREHOLE: 1) Borehole open upon completion. SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16 S



DRILLING DATA



PROJECT: Geotechnical, Hydrogeology Investigation and Phase Two ESA

CLIENT: ARGO Development Corporation

DATUM: Geodetic

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

Method: Solid Stem Auger Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-26-2021 ENCL NO .:

	M: Geodetic			o	00:	40.5		Date:	Mar-2	26-202	21					El	NCL N	0.:		
BORE	HOLE LOCATION: See Drawing 1 N 4 SOIL PROFILE	8102		81 E 5 SAMPL				DYNA	MIC CO	NE PE	NETRA	ATION						Π		
(m)	DESCRIPTION	, PLOT		7 4411 2	BLOWS 0.3 m	GROUND WATER CONDITIONS	NOI	SHE	AR ST	0 6 RENG	0 8 TH (ki	30 1 Pa)		PLASTI LIMIT W _P	CON	TURAL STURE NTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHAN AND GRAIN SI DISTRIBUT
59.3		STRATA PLOT	NUMBER	TYPE	"N"	GROUN	ELEVATION	• Q	NCONF UICK T 20 4	RIAXIAI	L ×		ANE O0			ONTEN 20	IT (%) 30	Š0	DTAN DTAN	(%) GR SA SI
5 9.0 0.2 58.5	TOPSOIL: 150mm CLAYEY SILT: trace gravel, trace topsoil, brown, moist, soft (weathered)		1	SS	3		159								0		0			
0.8	CLAYEY SILT TILL: sandy, trace gravel, trace cobble, brown, moist, very stiff to hard		2	SS	19		158								0					
			3	SS	25]									o					
			4	SS	35		157								0					
	grey to reddish brown below 3.1m		5	SS	94/ 50mm		156								0					
54.7							155													
4.6	SHALE BEDROCK: reddish brown, weathered	1 1/1	6	SS	92/ (00mr)															
							154													
6.2	END OF BOREHOLE: Notes: 1) Borehole dry and open upon		7	(88)	60/ 50mm															





CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-30-2021 ENCL NO.:

	SOIL PROFILE		s	AMPL	.ES			DYN/ RESI	AMIC CO STANCE	NE PEI	NETR/	ATION		DI 40=	_ NATI	URAL			-	METHANE
'm'		-				GROUND WATER CONDITIONS				0 60		0 10	00	PLASTI LIMIT	MOIS	TURE	LIQUID LIMIT W _L ——I	Ä.	¥	AND
m)		STRATA PLOT			BLOWS 0.3 m	W A	NO O							W _P	\	N	WL	ŒT P J (KPa	4 U.N	GRAIN SIZ DISTRIBUT
LEV PTH	DESCRIPTION	¥	JER		0.3		Y T	οι	AR ST	INED	÷	FIÉLD VA & Sensitiv	ANE rity					000	J. S.	(%)
		TR.	NUMBER	TYPE	‡	SROI	ELEVATION	• 0	QUICK T	RIAXIAL 0 60	. ×	LAB VA 0 10	ANE		TER CO	ONTEN 20 :	1 (%) 30		₹	CD CA CL
59.0 5 9.9 0.2	_TOPSOIL:180mm	1.4 1.				00		_	1								+	╁		GR SA SI
0.2	CLAYEY SILT: trace gravel, trace topsoil/rootlets, reddish brown,		1	SS	8			Ē							0	0				
58.2	_moist, firm (weathered)					1														
8.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	21		158	_							0			1		
	greyish brown, moist, very stiff to							Ē												
	hard		3	SS	38									0						
			_				157	_										1		
		13.	\vdash		56/															
		HH	14	SS	100mn	•		E						0						
55.9	OANDY OU T TILL						156											1		
3.1	SANDY SILT TILL: some clay, trace gravel, reddish brown, moist,		. 5	SS	60/ 125mn									0						
	very dense				12311111	"		[
			1				155	_										1		
			1					-												
54.3 4.7	SHALE BEDROCK:reddish brown,	1.91			56/	1		Ē												
7.7	weathered		6	SS	100mn	h	154	_										ł		
						1														
52.8							153	_										1		
6.2	END OF BOREHOLE:		Ý	(88	12mm															
	Notes: 1) Borehole open and dry upon																			
	completion.																			
																		1		
									1											
																		1		
									1											
																		1		
									1											
			1			l		l						1				1	l	
						I														



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-05-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES			DYN RES	AMIC CO	NE PEI	NETR/	ATION		DI	NAT	URAL			⊢	М	ETHAN
(m)		TO.			ω _l	VATER	7		20 4	0 60	3 0	30 10		PLASTI LIMIT W _P	C NAT MOIS CON	TURE TENT	LIQUID LIMIT w.	r PEN.	UNIT WI	GR	AND RAIN SI
EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE	AR STI	RIAXIAL	. ×	LAB VA	ANE	WA ⁻	TER CO	ONTEN		POCKEI (Cu) (k	NATURAL (kN/n	DIST	(%)
58.2	_TOPSOIL: 180mm	. ⁷ / 1 ^λ '.	ž		þ	ōŏ	<u> </u>	-	20 4	0 60	3 (30 10	00	1	0 2	20 3	30			GR :	SA SI
5 9.0 0.2 57.4	CLAYEY SILT: trace gravel, some topsoil, brown, moist, soft		1	SS	3		158	-									0				
0.8	(weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	18		157	-							0						
	brown, moist, very sun to hard		3	SS	25			-							o						
	greyish brown at 2.3m		4	SS	40		156	-							0						
	grey at 3.1m		_	SS	22		155	-							0						
			5		33			-													
							154	-													
			6	SS	26		153								∘ ⊩					5	23 49
-0.4																					
6.1	CLAYEY SILT TILL/SHALE COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish		7	SS .	51/ 100mn	 }	152								C	>		-			
	brown, moist, hard						151														
50.6			0	00	E4/																
5 0.6	SHALE BEDROCK: reddish brown. weathered		8	SS	51/ \00mn	_		_										\vdash			
	END OF BOREHOLE: Notes: 1) Borehole open and dry upon completion.																				









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-26-2021 ENCL NO.:

	SOIL PROFILE		_ s	SAMPL	.ES	_		RESIS	MIC CC STANCE	NE PE PLOT	NETRA	TION		PLASTIC	, NATI	JRAL	HOLID		E	METHAN
(m)		Τ̈́				GROUND WATER CONDITIONS				0 6		_	00	LIMIT	MOIS CON	TURE TENT	LIQUID	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND
	DECODIDATION	STRATA PLOT	~		BLOWS 0.3 m	W C	NO		R STI		ΓΗ (kF	a)		W _P	v	v 	W _L	ET (SAL U	GRAIN SI DISTRIBUT
LEV PTH	DESCRIPTION	ATA	NUMBER	ш	0.3	INOC	ELEVATION		NCONF UICK TI		+	FIELD V	ANE vity	WAT	FR CC	NTEN	T (%)	9 0 0	ATUTA 4	(%)
58.8		STR	N N	TYPE	ż	GRC	ELE			0 6				1			30			GR SA SI
5 8.6 0.2	TOPSOIL:180mm	131 1/2			<u> </u>			E												
58.0	CLAYEY SILT: sandy, trace gravel, brown, moist, firm (weathered)		1	SS	5		158								0	0				
0.8	CLAYEY SILT TILL: sandy, trace gravel, cobble, brown, moist, very stiff to hard		2	SS	19		130								0					
			3	SS	30		157								0					
			4	SS	31			E E							0					
55.4					60/		156													
3.4	SHALE BEDROCK: reddish brown, weathered	11.1	5	SS	250mn	1	155								0					
			6	SS	60/ 100mn	1	154	E												
							153													
			7	SS_	60/		133													
					1 <u>02mr</u>	1	152													
51.4					00/			Ė												
7.4	END OF BOREHOLE:		<u>.</u>	. SS	63/ 102mn															
	Notes: 1) Water at 5.3m upon completion.																			



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

Diameter: 150mm Date: Apr-05-2021

Method: Solid Stem Auger

DRILLING DATA

REF. NO.: 19-323-100

ENCL NO.:

	JIM: Geodetic	10101	11.0	10 F E	00400	CEC		Date.	Арг-С	15-202						Er	NCL N	O.:			
BURE	EHOLE LOCATION: See Drawing 1 N 4 SOIL PROFILE	18101	1	SAMPL		.000		DYNA	MIC CC	NE PE	NETR/	ATION		1							
\vdash	SOIL PROFILE	1	3	AIVIPL	.ES	e e				NE PE PLOT				PLASTI	C NATI	JRAL TURE	LIQUID LIMIT	2	NATURAL UNIT WT (kN/m³)	METH	
(m)		10			(NI	GROUND WATER CONDITIONS	_		Ĺ	1		1	00	LIMIT W _P	CON	TENT V	LIMI I W _L	POCKET PEN. (Cu) (kPa)	UNIT (°	ANI GRAIN	
ELEV	DESCRIPTION	STRATA PLOT	œ		BLOWS 0.3 m	N O	ELEVATION			RENG	TH (kF	Pa)	ΔNE	₩ _P		· 		9.5 E.S.	RAL KN/m	DISTRIB	
DEPTH	BESCHII HON	AT/	1BE	ш	90.	N E	\ \ \ \ \		NCONF	INED RIAXIAI	+	FIELD V. & Sensiti	vity	WA-	TER CC	ONTEN	T (%)	ğ0	UATU.	(%)
156.2		STR	NUMBER	TYPE	ż	GRC							00	1			30		_	GR SA	SI CL
15 0.2 15 0.0 0.2	TOPSOIL: 180mm						156										4				
0.2			1	SS	2		130											•			
155.4	topsoil, brown, moist, very soft (weathered)					1		-													
0.8	SILTY CLAY TILL: sandy, trace	137	2	SS	15										١.,					4 17	EE 04
F	gravel, occasional cobble/boulder,		-	33	15		155	-						-	○	1		┨		4 17 3	33 24
F	brown, moist, very stiff to hard		厂			1															
2			3	SS	28										0						
			1—			1	154														
E			1		50/	1	'0'	Ė													
<u> </u>			4	SS	130mn	h		-						'							
⁻³ 153.1		jøj						Ė													
3.1	CLAYEY SILT TILL/SHALE COMPLEX: trace sand, trace		5	SS	50/ \30mn		153							 				1			
E	gravel, occasional cobble/ boulder,				1,001111)	Ϊ		Ė													
4	reddish brown, moist, hard		1					Ė													
!			1				152							-				┨			
-151.6																					
15 4.5 4.7	Weathered SHALE BEDROCK: reddish brown,		6	. SS ,	52/ 12mm																
	END OF BOREHOLE:				(=)																
	Notes: 1) Borehole open upon completion.																				
	i) Borenole open upon completion.																				
<u>.</u>																					
2																					
[]																					
<u> </u>																					
														1							
														1							
<u> </u>														1							
														1							
														1							
														1							
<u> </u>														1							
<u> </u>																					

DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-26-2021 ENCL NO.:

BORE	EHOLE LOCATION: See Drawing 1 N 4	18101	70.6	E 598	615.88	3															
	SOIL PROFILE		S	SAMPL	ES	_ س		DYNA RESIS	MIC CC STANCE	NE PE E PLOT	NETR/	ATION		DI ASTI	C NATI	JRAL	LIOUID		5	METH	ANE
(m)		10			(0)	GROUND WATER CONDITIONS	_	2	0 4	0 6	0 8	30 10	00		CON	TENT	LIQUID	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AN GRAIN	
ELEV	DESCRIPTION	STRATA PLOT	Ľ.		BLOWS 0.3 m	NOI NOI	ELEVATION		AR STI	RENG	TH (kF	Pa) FIELD V & Sensiti	ANE	W _P ⊢	<u>`</u>	v >	W _L	CKET Cu) (K	RAL (kN/m	DISTRIB	
DEPTH		RAT,	NUMBER	TYPE		NO NO	EVA			RIAXIAI	L X	& Sensiti	vity ANE	WA	TER CC	NTEN	T (%)	80	NATI	(%	o)
156.7				≱	ż	R S	П	2	0 4	0 6	0 8	0 10	00	1	0 2	0 3	30			GR SA	SI CL
15 0.0	TOPSOIL: 155mm CLAYEY SILT: trace gravel, trace		1	SS	3			-								0					
155.9	topsoil/rootlets, brown, moist, soft (weathered)		}—				156														
0.8	SILTY CLAY TILL: sandy, trace	19/	2	SS	17		130								₀					2 19	54 25
	gravel, brown, moist, very stiff to hard		Ĺ	33	17			-												2 19	J4 ZJ
	cobble/boulder below 1.5m		3	SS	31		155	_							0						
2			Ľ	33	31																
	grey below 2.3m	191	├		70/																
			4	SS	72/ 75mm	1	154								0						
153.6		1/6/			04/																
3.1	SHALE BEDROCK: reddish brown, weathered		5	SS	61/ 125mn	n n		-													
							153														
-4																					
								-													
			6	SS	75/	1	152							_							
-					1\00mr			Ē													
E								E													
							151														
- 150.5	END OF DODELIOLE		7	SS	65/																
6.2	END OF BOREHOLE Notes:				25mm	4															
	1) Water at 4.9m upon completion.																				
i																					
<u> </u>																					
<u>[</u>																					
			Ц																Щ		

DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16

DRILLING DATA

Diameter: 150mm

REF. NO.: 19-323-100



PROJECT: Geotechnical, Hydrogeology Investigation and Phase Two ESA

CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

Method: Solid Stem Auger

	HOLE LOCATION: See Drawing 1 N 4 SOIL PROFILE			SAMPL				DYN RES	AMIC CO	ONE PEN E PLOT	NETRA	ATION			NATI	JRAL			F	METHANE
(m) LEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE	20 4 EAR STI UNCONF QUICK T	10 60 RENGT FINED) 8 H (kF + ×	0 10 Pa) FIELD V & Sensitiv LAB V	ANE vity ANE	PLASTIC LIMIT W _P WAT	CON V TER CO	TENT v D ONTEN	LIQUID LIMIT W _L ——I T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SI DISTRIBUT (%) GR SA SI
5 8.8 0.2	TOPSOIL: 180mm CLAYEY SILT: trace		1	SS	3											0				
54.9	topsoil/rootlets, greyish brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace						155													
	gravel, sand seams, brown, moist, very stiff to hard		2	SS	20										0					
			3	SS	29		154								0					
			4	SS	44		153								0					
3.1	SANDY SILT TILL: trace to some clay, trace gravel, reddish brown, moist, very dense		. 5	SS	87									0						
51.7	SHALE BEDROCK: reddish					-	152													
51.0	brown, weathered END OF BOREHOLE:			CC	50/															





CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

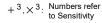
Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-25-2021 ENCL NO.:

BOREHOLE LOCATION: See Drawing 1 N 4809952.415 E 598432.379

	SOIL PROFILE		s	AMPL	ES	<u>_</u> ر		DYNA RESIS	MIC CO STANCE	NE PE PLOT	NETR	ATION -		PI ASTI	C NAT	URAL	LIOUID		Ţ.	MET	HANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	R		BLOWS 0.3 m	GROUND WATER CONDITIONS	NOIL	SHE	Ĺ	RENG	∟ TH (kl	1	00 ANE	LIMIT W _P	CON	STURE NTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (KN/m³)	GRAI DISTR	ND N SIZE BUTION
155.9		STRAT	NUMBER	TYPE	"N"	GROUN	ELEVATION	• Q	UICK T	RIAXIAI 10 6	LX	LAB V	ivity ANE 00			ONTEN	IT (%) 30	88	NATI	(GR SA	%) SLC
15 9 : 9	TOPSOIL: 255mm CLAYEY SILT: trace gravel, trace topsoil/rootlets, brown, very moist,		1	SS	3											0					
155.1 1 0.8	soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, brown, moist, stiff to hard		2	SS	17		155								0			-			
2			3	SS	24		154	-							0						
-	greyish brown below 2.3m		4	SS	23										0						
3			5	SS	30		153								o						
4							152											-			
-			6	SS	10		151								o ļ					4 26	50 2
-							131								•	•					
149.7 6.2	SANDY SILT TILL: some clay,		7	SS	46		150							0							
<u> 7</u>	trace gravel/cobble, grey, moist, dense to very dense		_		40		149														
-					90/																
<u>8</u>			8	SS	75mm		148							0				-			
² 146.8 9.1	SHALE BEDROCK: reddish brown,		9 /	SS /	87/		147											-			
- <u>o</u>	weathered				₹ <u>5mm</u>		146														
145.1			10	SS /	50/																
10.8	END OF BOREHOLE: Notes: 1) Water at 9.7m upon completion.			· /	1 <u>25m</u> r	h															







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

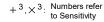
Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-25-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES	<u></u>		DYNA RESIS	MIC CC STANCE	NE PE PLOT	NETR.	ATION		PLASTI	C NAT	URAL	LIQUID	,	₩	METHANE
(m) ELEV DEPTH 156.2	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O UI	AR STI NCONF UICK T	LENG RENG INED RIAXIAI	TH (k + - ×	Pa) FIELD V & Sensit	ANE	LIMIT W _P	TER CO	URAL STURE ITENT W O ONTEN	LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZE DISTRIBUTIO (%) GR SA SI (
15 6.0 0.2	CLAYEY SILT: trace	·	1	ss	4		156	-							0	0				
155.4 1 0.8	moist, soft (weathered/disturbed) CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff to		2	SS	24		155								0					
2	hard occasional sand seams below 1.5m		3	SS	21										0					
•	greyish brown, cobble below 2.3m		4	SS	31		154								0					
153.1 3.1	SILTY CLAY TILL: sandy, trace		_	00	40		153											_		
	gravel, brown to grey, moist, very stiff		5	SS	19										0					
							152													
			6	SS	12		151								0			-		
149.8 14 9.6	SHALE BEDROCK: reddish brown.	XX.	7	SS	57		150													
	END OF BOREHOLE: Notes: 1) Borehole wet at bottom upon completion.																			







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-25-2021 ENCL NO.:

	SOIL PROFILE		s	AMPL	.ES	<u>_</u>		DYNA RESI:	MIC CO STANCE	ONE PE E PLOT	NETR/	ATION		PI ASTI	C NATI	URAL	LIQUID		ΛΤ	METHAN
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE.	AR STI NCONF UICK T	RENG INED RIAXIA	TH (kF + L ×	Pa) FIELD V & Sensiti LAB V	ANE vity ANE		TER CO	w O ONTEN	LIQUID LIMIT W IT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZ DISTRIBUTI (%) GR SA SI
50:2	TOPSOIL: 250mm	31 1/2	1	SS	3			-									0			
0.3 55.7	CLAYEY SILT: trace topsoil/rootlets, brown, moist, soft (weathered)				3		156									0	0	=		
8.0	CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff to hard		2	SS	16		155								0					
			3	SS	30										0					
	greyish brown below 2.3m		4	SS	30		154								0					
			5	SS	30		450								0					
							153													
51.9 4.6	SILTY CLAY TILL: trace sand,						152											-		
	trace gravel, cobble, grey, moist, very stiff		6	SS	18									C	b					
50.4							151													
6.1	SANDY SILT TILL: some clay, trace gravel, reddish brown, very moist, very dense		. 7	SS	92		150							()					
48.9	OUAL E DED DOOK			00	F0/		149													
48.8 7.7	SHALE BED ROCK. weathered, reddish brown END OF BOREHOLE: Notes: 1) Borehole open and wet upon completion.		(8)	(88)	50/ 1 <u>25m</u> r/															
	completion.																			
								l						1						



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

	JM: Geodetic EHOLE LOCATION: See Drawing 1 N 4	18101	12.5	45 E 5	98621	.164		Date	: Mar-	26-202	21					El	NCL N	O.:		
DOIL	SOIL PROFILE	1		SAMPL				l	AMIC CO			_		PLASTI	IC NAT	URAL STURE	LIQUID	!	TW	METHANE
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE	AR ST JNCONF QUICK T	RENG INED RIAXIA	TH (ki + L ×	Pa) FIELD V & Sensit LAB V	/ANE tivity /ANE		TER C	ITENT W O ONTEN	LIMIT W _L —— IT (%) 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (KN/m³)	AND GRAIN SIZ DISTRIBUTI (%) GR SA SI
15 6.0 155.3	TOPSOIL: 150mm CLAYEY SILT: trace gravel, trace topsoil/ rootlets, brown, moist, firm		1	SS	4		156									0				
0.8	(weathered) CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff to hard		2	SS	25		155								-					
	nard		3	SS	37		154								o					
	grey below 2.3m		4	SS	40	-	104								•					
3.1	SHALE BEDROCK: reddish brown, weathered		5	SS	93/ 275mr	<u> </u>	153													
							152													
151.4 4.7	END OF BOREHOLE		6	ES_	63/ 75mm	l l														



GRAPH NOTES

+ ³, × ³: Numbers refer to Sensitivity

O ^{8=3%} Strain at Failure



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

Method: Solid Stem Auger

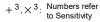
DRILLING DATA

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-26-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES	ıK.		DYN/ RESI	AMIC CO STANCE	NE PE E PLOT	NETR/	ATION		PLAST	IC NATI	URAL TURE TENT	LIQUID LIMIT		WT	METHANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE O L	AR STI	RENG INED	TH (ki + L ×	FIELD V. & Sensiti LAB V.	ANE vity		TER CO	w OMTEN	W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZ DISTRIBUTI (%) GR SA SI
158.9	TOPSOIL:150mm CLAYEY SILT: trace topsoil, trace gravel, brown, moist, firm		1	SS	5	-	155								0	٥				
0.8	(weathered) CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff to hard		2	SS	20										0					
			3	SS	26		154								0					
	brown to grey below 2.3 m		4	SS	44		153							,	•					
3.1	SHALE BEDROCK: reddish brown, weathered		5	SS	68		152											-		
50.6			6	SS	64/ 75mn		151	-												
	1) Borehole open and dry after 4.42m.																			







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

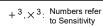
Method: Solide Stem Auger

DRILLING DATA

Diameter: 150mm REF. NO.: 19-323-100

				. .				Date:	iviar-2	25-202	1					ΕN	ICL N	O.:		
BORE	HOLE LOCATION: See Drawing 1 N 48 SOIL PROFILE	30995		49 E 5 AMPL				DYNA RESIS	MIC CO	NE PE E PLOT	NETRA	ATION		L	_ NATI	JRAI			-	METHAN
(m) ELEV DEPTH	DESCRIPTION		NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O UI	AR STINCONF	0 6 RENG	0 8 TH (kF + - ×	L Pa) FIELD \ & Sensif LAB V	/ANE		CON V TER CC	TENT W DOMTEN	LIQUID LIMIT W _L ——I T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SI DISTRIBUT (%) GR SA SI
0.2 154.1	CLAYEY SILT: sandy, trace gravel, trace topsoil/rootlets, brown, very		1	SS	5										0	0				
0.8	moist, firm (weathered) CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff to hard		2	SS	30		154								0			-		
			3	SS	37		153								0					
	sand seams, grey below 2.3m		4	SS	32		450								0					
	reddish brown at 3.1m		5	SS	40		152								0					
							151											_		
4.6	SANDY SILT TILL: trace clay, trace gravel, cobble, greyish brown, moist, very dense		6	SS	55		150							-						
	most, very dense																			
48.7 48.2	SHALE BEDROCK: reddish brown, 7	-[ø].	7	SS	50/		149													
6.3	Weathered END OF BOREHOLE: Notes: 1) Borehole open and dry upon completion.																			







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

BORE	M: Geodetic HOLE LOCATION: See Drawing 1 N 4	18098	39.68	82 E 5	98595	.772			: Mar-						_	NCL N	O			
	SOIL PROFILE		S	AMPL	ES	띪		DYN. RES	AMIC C ISTANC			_	PLAST LIMIT	IC NA	TURAL ISTURE	LIQUIE LIMIT)	TW.	METH. AN	
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	0 1	AR ST JNCON QUICK	RENC FINED	STH (k + AL ×	Pa) FIELD & Sens	W _P ⊢ WA	TER C	NTENT W ONTE	W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (KN/m³)	GRAIN DISTRIB (%	SIZ UTI)
59.9	TOPSOIL: 150mm CLAYEY SILT: trace sand, trace		1	SS	3			-												
52.8	gravel, trace topsoil/rootlets, brown, _moist, soft (weathered)					-	153	_					_				-			
0.8	CLAYEY SITL TILL: sandy, trace gravel, moist, brown, very stiff to hard		2	SS	23									0						
			3	SS	29		152	<u>-</u> - - -						0						
			4	SS	46	-	151							0						
	grey below 3.1m		5	SS	55		150						٥							
						-	150													
			6	SS	27		149							0			-			
							148													
			7	SS	60/	-								0						
					76mm] - 	147	<u> </u>												
46.0 7.6	SANDY SILT TILL: trace clay,						146													
7.0	trace gravel, occasional cobble/boulder, reddish brown, moist, very dense		8	SS	77/ 76mm) -							(o						
44.5 9.1	SHALE BEDROCK: reddish brown,		9	SS	50/		145													
	weathered		Ů		25mm	1	144													
42.9							143													
10.7	END OF BOREHOLE: Notes: 1) Borehole dry and open upon completion.		10	\SS_	60/ 75mm	4														_



PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

CLIENT: ARGO Development Corporation

Method: Solid Stem Auger

DRILLING DATA

Diameter: 150mm REF. NO.: 19-323-100

PROJ	JECT LOCATION: 3069 Dundas St W, O	akvi	iie, C	N				Diame	ter: 1	50mm						RE	=F. NC).: 19	9-323	-100
DATU	JM: Geodetic							Date:	Mar-2	23-202	1					EN	NCL N	0.:		
BORE	EHOLE LOCATION: See Drawing 1 N 48	8098	324.0	96 E 5	98768	.411														
	SOIL PROFILE		5	SAMPL	.ES	~		DYNAN RESIS	IIC CC	NE PE PLOT	NETRA	ATION		PLASTI	C NATI	JRAL TURE	LIQUID		ΛΤ	METHANE
(m) ELEV DEPTH 152.4	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O UN • QL	R STE ICONF IICK TE	LENG RENG INED RIAXIAI	TH (kF + L ×	Pa) FIELD V/ & Sensiti LAB V/	ANE vity ANE	LIMIT W _P ⊢ WAT	CON' V TER CC	TENT v D ONTEN	LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT \ (KN/m³)	AND GRAIN SIZE DISTRIBUTIO (%) GR SA SI
15 2.0 0.2	TOPSOIL: 150mm CLALYEY SILT: trace sand, trace gravel, trace topsoil, brown, moist,		1	SS	6		152								0					
151.6 1 0.8	graver, brown, moist, very still to		2	SS	24		151								0					
<u>.</u>	hard		3	SS	33		151								0					
			4	SS	36		150	-							0			-		
3 148.7	grey below 3.1 m		5	ss	26		149								0					
3.7	END OF BOREHOLE:																			



DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16

GRAPH NOTES

+ ³, × ³: Numbers refer to Sensitivity

O ^{8=3%} Strain at Failure



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

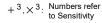
Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-24-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES	· ·		DYNA RESIS	MIC CC STANCE	NE PE PLOT	NETR/	ATION		PI ASTI	, NAT	URAL STURE	LIQUID		5	METHANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	ZEK		BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O U	AR STI	0 6 RENG	TH (kf	Pa) FIELD V.	OO L ANE vity	PLASTIC LIMIT W _P	CON	TENT W	LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZE DISTRIBUTIO (%)
154.8			NUMBER	TYPE	Ž.	GROU	ELEV,	• u	UICK II	RIAXIAI 0 6	- ^	LAD V	ANE 00	WAT		ONTEN 20 3	T (%) 30 +	Ĺ	₹	GR SA SI
15 4.6 0.2	CLAYEY SILT: trace sand, trace topsoil/ rootlets, dark brown, very		1	SS	2											0				
0.8	moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff to	74 M	2	SS	21		154	<u> </u>							0					
	hard		3	ss	32		153								0					
	 - -		4	SS	27										•					
<u>.</u>	grey below 3.1m		4		37		152	<u> </u>							0					
	grey below 0.1111		5	SS	31		151								0					
!																				
<u>i</u>			6	SS	24		150								0					
							149													
148.7 6.1	SANDY SILT TILL: trace clay, trace gravel, cobble/boulder,		7	SS	31		143								0					
	reddish brown, very moist, dense to very dense		,		31		148													
			8 🛦	SS /	50/									o						
1					25mr	1	147													
	·						146													
145.7 145.6 9.2	CHALE: reddish brown, weathered END OF BOREHOLE:		9	SS /	100/ 25mm			<u> </u>												
	Notes: 1) Water at 8.23m. 2) Borehole open upon completion.																			







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: May-07-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	.ES			DYN/ RESI	AMIC CC STANCE	NE PE PLOT	NETRA	ATION		DI ACT		JRAL	1101115		F	METHANE
(m)		T				GROUND WATER CONDITIONS				10 6		0 10	00	PLASTI LIMIT	MOIS	TURE	LIQUIE LIMIT W _L T (%)	I Ä	×	AND
		STRATA PLOT			BLOWS 0.3 m	WA	Z							W _P		v	\mathbf{W}_{L}	(FP a	15°C	GRAIN SIZ
LEV PTH	DESCRIPTION	ΙŽ	NUMBER		0.3		ELEVATION	0 L	AR STI	INED	+	FIELD V	ANE vitv	-)——		ξĝ	돌	DISTRIBUTION (%)
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\] ME	TYPE		집	EV.	• 0	QUICK T	RIAXIAL	- ×	LAB V	ANE		ER CC	NTEN	T (%)	ľ	₹	(70)
53.5			ž		ż	<u>0</u> 0	Ш		20 4	0 6	0 8	0 10	00	1	0 2	0 3	30			GR SA SI
9.9 0.2	TOPSOIL: 150mm		1	SS	3			Ē								c				
	CLAYEY SILT: trace sand, trace gravel, some topsoil, brown, moist,		1)			153	<u> </u>								<u> </u>	1	-		
2.7	_soft (weathered)	-1414						Ė												
8.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	17			F							0					
	brown, moist, very stiff to hard	FIN	1				450	Ē												
			1			1	152											1		
		HH	3	SS	30			Ē							0					
		1,41						Ė												
	grey at 3.1m		4	SS	32		151	_										-		5 12 45
		ЦŊ	1 4	33	32			-							Φ-					3 12 43
			匚			1		-												
			5	SS	56		450	Ē												
		[]	Ľ				150													
		;	1					Ė												
			1					Ė												
8.9		111					149	<u> </u>	-									4		
18.8	CLAYEY SILT TILL/SHALE	1////	6	SS_	51/	1		F						0						
4.7	COMPLEX: trace sand, trace gravel, occasional cobble/ boulder,				75mm	1		F												
	reddish brown, moist, hard						440	Ē												
	SHALE BEDROCK: reddish brown,						148	E												
	weathered							Ė												
17.3 6.2	END OF BOREHOLE:	-	7	- SS	50/			_										+		
0.2	Notes:				25mm	1														
	Borehole open and dry upon completion.																			
	completion.																			
		1																		
																			1	



PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA CLIENT: ARGO Development Corporation

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-24-2021 ENCL NO.:

,	SOIL PROFILE		s	SAMPL	ES.	<u>~</u>		RESIS	MIC CO STANCE	NE PE E PLOT	NETR.	ATION		PLASTI	C NATI	URAL	LIQUID		Υ	METHANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE/	AR ST NCONF UICK T	RENG INED RIAXIA	TH (kl + L ×	FIÉLD \ & Sensit LAB V	/ANE tivity	W _P WA	CON \ TER CC	TENT W O ONTEN	LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (KN/m³)	AND GRAIN SIZI DISTRIBUTIO (%) GR SA SI
151.0 15 9.9	TOPSOIL: 150mm			SS	3											0				OK OA OI
-	CLAYEY SILT: trace sand, trace gravel, trace top soil/rootlets, grey,		1	33	3			Ė							٥					
150.2 1 0.8	moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	22		150								0			-		
- - - - - 2	grey, moist, very stiff to hard		3	SS	24		149								o					
- - - - -			4		45										•					
3							148													
			5	SS	46										0					
- <u>4</u> - - -							147													
- - - - 5			6	SS	46		146								•			=		
-																				
6.1 - 6.1	SANDY SILT TILL: trace clay, trace gravel, occasional cobble/boulder, reddish brown,		. 7	SS	52/ 130mn	M	145							0						
- - - <u>7</u> -	moist, dense to very dense						144													
- - - - - 8			. 8	SS	56/ 130mn		143								0					
		 - -																		
- - - 9		φ	9	SS	70/		142							0				-		
- - - - 10		- - - -	Ľ		100mn		141													
- - - -							''													
11 11			. 10	SS	97/ 130mn		140							-				-		
-							400													
138.8	SHALE BEDROCK: reddish brown, weathered		11	SS	70/		139													
13 -	weaticicu		<u> </u>		130mn		138													
138.8 122 138.8 12.2 133 133 14 138.8 12.2 133 133 133 133 133 133 133 133 133 13	END OF BOREHOLE: Notes: 1) Water at 12.5m upon completion.		12 / (13 /		60/ 10mm															



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-23-2021 ENCL NO.:

	SOIL PROFILE		S	AMPL	ES			DYN. RES	AMIC CO STANC	ONE PE E PLOT	NETR	ATION		PI AST	IC NAT	URAL	LIQUID		Υ	METHAN	۱E
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE	AR ST JNCONI	RENG FINED RIAXIA	TH (kl	Pa) FIELD \ & Sensi LAB V	/ANE tivity /ANE	W _P WA	TER C	NTENT W O O O O O O O O O O O O O O O O O O	LIMIT WL IT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SI DISTRIBUT (%)	IZI
154.3	TOPSOIL: 150mm	.74 1 ²⁶ .	z		-	0 0	Ш	_	1	+0 (80 0		100	ļ '	10 2	20	30			GR SA SI	_
15 4.0 0.2 153.5	CLAYEY SILT: trace sand, trace gravel, trace topsoil/rootlets, moist, soft (weathered)		1	SS	3		154	<u>-</u> - - -								0					
8.0	CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff		2	SS	19		153								0						
			3	SS	27										0						
			4	SS	28	_	152								0						
			5	SS	26		151	-							0						
						_															
149.7 4.6	SILTY CLAY TILL: some sand,					-	150														
	trace gravel, trace cobble, grey, moist, stiff to very stiff		6	SS	13	-	149								0						
						-															
			7	SS	23	-	148	-							0						
146.7							147	- - - -													
7.6	SANDY SILT TILL: some clay, trace gravel, reddish brown, moist, very dense		_8_	_SS_	52/ \30mr										o						
,,,,,		• - -					146														
9.1	SHALE BEDROCK: reddish brown, weathered	.[q.]	9	SS_	51/ 25mm	-	145														
!							144	-													
143.5							144	Ė													
143.5 10.8	END OF BOREHOLE: Notes: 1) Water level at 10.3m upon completion.		(10)	<u> </u>	75mn																-



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

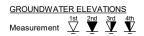
DRILLING DATA

Method: Solid Stem Auger

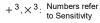
Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-23-2021 ENCL NO.:

	SOIL PROFILE		s	AMPL	ES	~		DYNA RESI	AMIC CO STANCI	ONE PE E PLOT	NETR/	ATION		PLASTI	C NAT	URAL	LIQUID		ΤΛ	METHA	NE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE.	AR ST INCONF OUICK T	RENG INED RIAXIA	TH (kF + L ×	Pa) FIELD V & Sensiti LAB V	ANE vity ANE O0	W _P ⊢ WA1	CON V TER CO	TENT W O ONTEN	LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN S DISTRIBU (%)	SIZI
154.4	TOPSOIL: 250mm	×1 1/2.						_													_
0.3 153.9	CLAYEY SILT: trace sand, trace gravel, trace topsoil/rootlets, grey, moist, firm (weathered)		1	SS	5		154									0					
0.8	CLAYEY SILT TILL: sandy, trace gravel, grey, moist, very stiff to hard		2	SS	20										٥						
.			3	SS	29		153								0						
	grey, occasional cobble/boulder below 2.3m		4	SS	50		152							0							
			5	SS	53										o						
						_	151														
			6	SS	23		150								0						
			0		23	<u>-</u>															
			1				149	_										1			
148.6 6.1	SANDY SILT TILL: trace clay, trace gravel, occaional cobble/boulder, reddish brown, very moist, very dense		7	SS	96/ 75mm	 - -	148							o				-			
147.1 7.6	SHALE BEDROCK: reddish brown,		. 8 /	SS	75/	_	147														
2 7.0	weathered)	(00)	25mm	(147														
145.9							146														
8.8	END OF BEDROCK: Notes: 1) Water at 8.5 m upon completion.		9	AS	55/ (2mn)		140														







REF. NO.: 19-323-100



PROJECT: Geotechnical, Hydrogeology Investigation and Phase Two ESA

CLIENT: ARGO Development Corporation

DATUM: Geodetic

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

Method: Solid Stem Auger

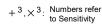
Diameter: 150mm

Date: Apr-06-2021 ENCL NO.:

	SOIL PROFILE		5	SAMPL	ES	<u>~</u>		DYNA RESIS	MIC CC TANCE	ONE PE E PLOT	NETR/	ATION		PLASTI	C NAT	URAL	LIQUID		ΤV	М	ETHAN	۱E
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O U	AR STI NCONF UICK T	RENG INED RIAXIA	TH (kl + L ×	Pa) FIELD V & Sensit LAB V	OO L ANE ivity ANE OO	- W _P 	CON TER C	NTENT W O	LÎMIT W _L 	POCKET PEN. (Cu) (kPa)	NATURAL UNIT V (kN/m³)	DIST	AND AIN SI RIBUT (%)	TIC
5 4.9 0.2	TOPSOIL: 180mm	1/1/2	1					-														_
153.7	CLAYEY SILT: trace sand, trace gravel, some topsoil/rootlets, brown, moist, soft (weathered)		1	SS	3		154								С	0						
8.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	21		153								0							
			3	SS	28	-	100								• ⊩	+				6 ′	19 53	}
			4	SS	38	-	152								0							
			5	SS	38		151								0							
							101															
	grey at 4.6m		6	SS	26	-	150								0							
							149															
148.4																						
6.1	SANDY SILT TILL/SHALE COMPLEX: trace clay, trace gravel, occasional cobble/ boulder,		7	SS	61		148							0								
7.0	reddish brown, moist, very dense SHALE BEDROCK: reddish brown, weathered																					
			8	SS_	61/ 50mm		147															
							146															
145.3																						
9.2	END OF BOREHOLE: Notes: 1) Water at 6.1m. 2) Borehole open and wet upon completion.		9	AS	60/ 12mm																	









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-22-2021 ENCL NO.:

BOREHOLE LOCATION: See Drawing 1 N 4809746.686 E 598742.538

	SOIL PROFILE		SA	AMPL	ES	œ.		RES	AMIC C ISTANC	ONE PE E PLOT	NETR.	ATION	ı	PLAST	IC NAT	TURAL STURE	LIQUID LIMIT		ΤW	METHANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	οι	AR ST JNCON QUICK	RENG FINED RIAXIA	TH (k + L ×	Pa) FIELD & Sens LAB	VANE sitivity VANE 100	W _P WA	COI TER C	NTENT W OONTEN	W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZE DISTRIBUTIO (%) GR SA SI (
15 9.0 0.2	TOPSOIL: 150mm CLAYEY SILT: trace sand, trace of topsoil/rootlets, brown, moist, soft (weathered)		1	SS	3		152									0				
0.8	CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff to hard		2	SS	24										o					
			3	SS	35		151								o					
3			4	SS	32		150								0					
<u>4</u>			5	SS	40		149	-						,	•			-		
5			6	SS	17		148								아		-			1 12 49
							147													
	grey below 6.1m		7	SS ,	56/ 100mn) 1	146	-						,	•			_		
<u>8</u>			8	SS	57		145	-						0				-		
							144													
9.1	SANDY SILT TILL: trace clay, trace gravel, occasional cobble/boulder, greyish brown, moist, very dense		9	SS	56/ 75mm		143							0						
<u>)</u>	reddish brown below 10.7m		10 🛦	SS /	70/		142	-						0						
1			<u></u>		00mr	1	141													
140.7 140.8 12.0	Weathered END OF BOREHOLE: Notes: 1) Borehole open and dry upon completion.		11	SS)	93/ (00mr)	1		-												



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

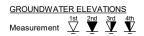
DRILLING DATA

Method: Solid Stem Auger

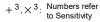
Diameter: 150mm REF. NO.: 19-323-100

Date: Mar-22-2021 ENCL NO.:

	SOIL PROFILE		s	AMPL	ES	œ		DYNA RESI	AMIC CO STANCI	NE PE E PLOT	NETR/	ATION		PLASTI	C NAT	URAL	LIQUID		₩	METH	
(m) ELEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHE.	AR ST INCONF OUICK T	RENG INED RIAXIA	TH (ki + L ×	Pa) FIELD V & Sensiti LAB V	ANE wity ANE	- W _P 	CON TER CO	ITENT W O ONTEN	LIMIT W _L 	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)		I SIZI BUTIC 6)
153.1	TOPSOIL: 150mm	ν, 1 ^χ ,	Z	<u> </u>	<u>-</u>	00	ш 153		20 4	10 6	30 8	30 1	00	1	0 2	20	30	┢		GR SA	SI
15 9.0 152.3	CLAYEY SILT: trace sand, trace gravel, trace topsoil/rootlets, brown, moist, firm (weathered)		1	SS	5		100									0					
0.8	CLAYEY SILT TILL: sandy, trace gravel, brown, moist, very stiff hard		2	SS	28		152								0						
			3	SS	38		151								0						
			4	SS	40										0						
			5	SS	46		150								0						
							149														
			6	SS	31										•						
							148														
	grey below 6.1m		7	SS	23		147								0						
					23																
145.5 7.6	SANDY SILT TILL: some clay,						146														
.	trace gravel, trace cobble, greyish brown, moist, compact to very dense		. 8	SS	29		145								0			_			
		 •	<u>. </u>				144														
		0	9	SS	64									٥							
142.4		φ					143														
10.7	SHALE BEDROCK: reddish brown, weathered		10	SS	110/ 127mn																
142.4 10.7 141.9 11.2	END OF BOREHOLE: Notes: 1) Borehole open and dry upon completion.		11	<u>AS</u>	100/ 25mr	_	142														
																		1			









CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

PROJECT LOCATION COOR P. L. COM. C. L. III. CN

DRILLING DATA

Method: Solid Stem Auger

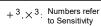
Diameter: 150mm REF. NO.: 19-323-100

Date: May-06-2021 ENCL NO.:

	M: Geodetic							Date:	May-	06-202	21					EN	ICL N	0.:		
BORE	HOLE LOCATION: See Drawing 1 N 4	48098	_			.111		Ιηννια	MIC CO	NIE DE	NETRA	TION						_		
	SOIL PROFILE	_		SAMPL	ES.	<u>بر</u>		RESIS	STANCE	PLOT	NETRA			PLASTI I IMIT	C NAT	URAL	LIQUID		₩	METHANI
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O U	AR ST NCONF UICK T	RENG INED RIAXIA	TH (kF	FIÉLD V & Sensit LAB V	'ANE	W _P ⊢ WA	CON Y TER CO	TENT W DOMTEN	LIQUID LIMIT W _L T (%)	POCKET PEN (Cu) (kPa)	NATURAL UNIT (kN/m³)	AND GRAIN SIZ DISTRIBUTI (%) GR SA SI
150.0	TOPSOIL: 150mm	111					154											1		0.1. 0,1. 0.
153.4	CLAYEY SILT: trace sand, trace gravel, some topsoil, brown, moist, firm (weathered)			SS	5			- - -							0					
0.8	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	22		153								0			-		
2			3	SS	25		450								∘ ⊩	-1				3 17 56
			4	SS	29		152	-							0					
3			5	ss	30		151	-							0					
4							450													
	grey at 4.6m						150	-												
5			6	SS	22		149								o 					3 14 46
148.1																				
6.1	CLAYEY SILT TILL/SHALE COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish		7	ss	54		148	-						c						
7	brown, moist, hard						147													
7.6 8146.2	SHALE BEDROCK: reddish brown, weathered		8	SS /	61/ 30mm	n		-												
8.0	END OF BOREHOLE: Notes: 1) Borehole open and dry upon completion.				55/ (2mm)															



GRAPH NOTES



REF. NO.: 19-323-100



PROJECT: Geotechnical, Hydrogeology Investigation and Phase Two ESA

CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm

SOIL PROFILE		5	SAMPL	.ES			DYNA RESIS	MIC CO	NE PE	NETR.	ATION		DI	_ NAT	URAL			F	METH	ANF
DESCRIPTION	STRATA PLOT	NUMBER	гуре	'N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O U • Q	20 4 AR ST NCONF UICK T	RENG INED RIAXIA	TH (kl	Pa) FIELD V & Sensiti	ANE ivity ANE	w _P ⊢ WA	CON Y TER CO	TENT W O ONTEN	LIMIT W T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT W (kN/m³)	AN GRAIN DISTRIB (%	D SIZ UTI
TOPSOIL: 200mm	1/1/2	1	SS	3			-								0				GIV SA	31
topsoil/rootlets, trace gravel, brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace		2	SS	16	<u> </u> - -	153								О			-			
stiff to hard		3	SS	26		152								0			-			
		4	SS	23		151								o						
		5	SS	31										0						
					-	150	-										-			
		6	SS	20		149								0						
						148														
SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard		7	SS	22		147								0						
							- - - - - - -													
greyish brown at7.62		8	SS	81		146							0				-			
				544		145											-			
SANDY SILT TILL: trace clay, trace gravel, reddish brown, moist, very dense		9	SS		<u></u>	144							0							
		. 10	SS	92/		1/13								0						
SHALE BEDROCK: reddish brown, weathered					1	140														
		14	66	007		142	<u> </u>													
END OF BOREHOLE: Notes: 1) Water at 10.4 m. 2) Borehole wet upon completion.		(11)	<u>. 88</u>		(
	SOIL PROFILE DESCRIPTION TOPSOIL: 200mm CLAYEY SILT: trace sand, trace topsoil/rootlets, trace gravel, brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, brown to grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard greyish brown at7.62 SANDY SILT TILL: trace clay, trace gravel, reddish brown, moist, very dense SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 1) Water at 10.4 m.	SOIL PROFILE DESCRIPTION TOPSOIL: 200mm CLAYEY SILT: trace sand, trace topsoil/rootlets, trace gravel, brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, brown to grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard greyish brown at 7.62 SANDY SILT TILL: trace clay, trace gravel, reddish brown, moist, very dense SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 1) Water at 10.4 m.	SOIL PROFILE DESCRIPTION TOPSOIL: 200mm CLAYEY SILT: trace sand, trace topsoil/rootlets, trace gravel, brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, brown to grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard For a series of the sandy trace gravel, grey, moist, very stiff to hard SANDY SILT TILL: trace clay, trace gravel, reddish brown, moist, very dense SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 1) Water at 10.4 m.	SOIL PROFILE DESCRIPTION TOPSOIL: 200mm CLAYEY SILT: trace sand, trace topsoil/rootlets, trace gravel, brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, brown to grey, moist, very stiff to hard 3 SS 4 SS 5 SS SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard 7 SS SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard 7 SS SANDY SILT TILL: trace clay, trace gravel, reddish brown, moist, very dense SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 10 SS	DESCRIPTION DESCRIPTION TOPSOIL: 200mm CLAYEY SILT: trace sand, trace topsoil/rootlets, trace gravel, brown, moist, soft (weathered) CLAYEY SILT TILL: sandy, trace gravel, brown to grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard SANDY SILT TILL: trace clay, trace gravel, reddish brown, moist, very dense SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 10 SS MPLES A W B W B W B W B W B W B W B W B W B W B W B W B B W B B W B	TOPSOIL: 200mm CLAYEY SILT: trace sand, trace topsoil/room to grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, prown, stiff to hard SILTY CLAY TILL: sandy, trace gravel, prown, stiff to hard SILTY CLAY TILL: sandy, trace gravel, prown to grey, moist, very stiff to hard SILTY CLAY TILL: sandy, trace gravel, grey, moist, very stiff to hard TOPSOIL: 200mm 1	SOIL PROFILE	SOIL PROFILE SAMPLES BESCRIPTION DESCRIPTION DESCRIPT	SOIL PROFILE SAMPLES DESCRIPTION LATER STANCE DESCRIPTION SHEAR STANCE OUNCONT OUNCONT	SOIL PROFILE SAMPLES DESCRIPTION DESCRIPT	SOIL PROFILE SAMPLES DESCRIPTION DESCRIPT	SOIL PROFILE	DESCRIPTION DESCRIPTION	SOIL PROFILE	SOIL PROFILE	SOIL PROFILE SAMPLES SAMPLES	SOIL PROFILE	SOIL PROFILE	SOIL PROFILE SAMPLES SAMPLES	SOIL PROFILE SAMPLES SAMPLES



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

Date: Apr-06-2021

DRILLING DATA

Method: Solid Stem Auger Diameter: 150mm REF. NO.: 19-323-100

ENCL NO.:

SOIL PROFILE		S	AMPL	ES	~		DYN/ RESI	AMIC CO STANC	ONE PE E PLOT	NETRA	ATION		рі деті	C NATI	URAL	חווטווט		۲	METHANE
DESCRIPTION	TRATA PLOT	UMBER	YPE	4" BLOWS 0.3 m	ROUND WATER ONDITIONS	LEVATION	SHE O L	AR ST INCONI QUICK T	RENG INED RIAXIA	TH (kF + L ×	Pa) FIELD V & Sensiti LAB V	ANE vity ANE	w _P	CON V TER CO	TENT W DOMTEN	LIMIT W T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT M (KN/m³)	AND GRAIN SIZ DISTRIBUTIO (%)
TOPSOIL : 180mm	11/2	z		-	0 0	Ш	_	20 4	+0 6			00	'			1			GR SA SI
CLAYEY SILT: trace sand, trace gravel, some topsoil/rootlets, brown,		1	SS	3		153									0				
CLAYEY SILT TILL: trace sand, trace gravel, occasional		2	SS	16										0					
cobble/boulder, brown, moist, very stiff to hard		3	SS	30		152								0			-		
		4	SS	31		151								0			-		
		_		20															
				30	_	150	-										-		
grey at 4.6m						149													
		6	SS	23	-	140								0					
						148													
		7	SS	78	-	147								0			-		
						1/16													
CLAYEY SILT TILL/SHALE COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish		8	SS	51/ \30mŋ		140							0						
brown, moist, nard						145													
		9	SS /	52/ 25mm		144							0						
SHALE BEDROCK: reddish brown,	77.7	10	00	FAL			-												
Notes: 1) Borehole open and dry upon completion.				(2mm															
	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace gravel, some topsoil/rootlets, brown, moist, soft (weathered) CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL/SHALE COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish brown, moist, hard SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 1) Borehole open and dry upon	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace gravel, some topsoil/rootlets, brown, moist, soft (weathered) CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL/SHALE COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish brown, moist, hard SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 1) Borehole open and dry upon	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace gravel, some topsoil/rootlets, brown, moist, soft (weathered) CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL/SHALE COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish brown, moist, hard SHALE BEDROCK: reddish brown, veathered END OF BOREHOLE: Notes: 1) Borehole open and dry upon	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace gravel, some topsoil/rootlets, brown, moist, soft (weathered) CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard GLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard GLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, reddish brown, moist, hard CLAYEY SILT TILL/SHALE COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish brown, moist, hard SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 18 SS	DESCRIPTION Data D	DESCRIPTION TOPSOIL: 180mm	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard CLAYEY SILT TILL: trace sand, trace gravel, occasional cobble/boulder, reddish brown, moist, hard CLAYEY SILT TILL: shale SHALE BEDROCK: reddish brown, weathered END OF BOREHOLE: Notes: 1) Borehole open and dry upon	DESCRIPTION A	DESCRIPTION Topsoil: 180mm Clayer SilT: trace sand, trace gravel, some topsoil/rodlets, brown, moist, soft washered 2 SS 16	DESCRIPTION 1	DESCRIPTION	DESCRIPTION	DESCRIPTION Description D	DESCRIPTION Comparison Com	DESCRIPTION Description D	DESCRIPTION Description D	DESCRIPTION	DESCRIPTION Description	DESCRIPTION 1



PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

CLIENT: ARGO Development Corporation Method: Solid Stem Auger

DRILLING DATA

Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-07-2021 ENCL NO.:

	SOIL PROFILE		s	AMPL	ES			DYN. RES	AMIC CO STANCE	NE PE	NETRA	NOITA		DI	NAT	URAL			F	METI	HANE
m)		Ē				[]						_	00	LIMIT	C NAT MOIS CON	TURE ITENT	LIQUID	EN C	N F	1A	ND
EV PTH	DESCRIPTION	STRATA PLOT	œ		BLOWS 0.3 m	GROUND WATER CONDITIONS	NOF	SHE	AR STI	RENG	TH (kF	Pa)	ANF	W _P ⊢		w •	LIQUID LIMIT W _L ——I	CKET F	RAL UN	GRAII DISTRI	
PTH	DESCRIPTION	RAT/	NUMBER	TYPE		NUOS	ELEVATION	• (UNCONF	·INED RIAXIAL	+ - ×	& Sensitiv	vity ANE	WA	TER CO	ONTEN	T (%)	80	MATU	(0	%)
52.8	TORCOIL : 400	.7/ /V.	ž	<u></u>	þ	<u>R</u> S	ᆸ	-	20 4	0 6	0 8	0 10	00	1	0 2	20 3	30			GR SA	SI (
0.2	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace		1	SS	3			Ė									٥				
52.0	gravel, some topsoil/rootlets, brown, _moist, soft (weathered)						152	_													
8.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder,		2	SS	21		102	Ē							H					3 20	54 2
	brown, moist, very stiff to hard					1		Ē													
			3	SS	24		151	-							0						
								Ē													
			4	SS	45			-							•						
							150	-										1			
	grey at 3.1m	1	5	SS	75			Ė							∘⊩					1 13	46 4
			\vdash			1	149	<u> </u>										-			
								E													
48.2 4.6	CLAYEY SILT TILL/SHALE				50/			Ē													
4.0	COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish		6	SS	52/ 130mn	h m	148	-	1						0						
17.4	_brown, moist, hard							-													
5.2 5.6	SHALE REDROCK: reddish brown, weathered		7	AS /																	
	END OF BOREHOLE: Notes:																				
	Borehole open and dry upon completion.																				
	completion.																				
		1	1				l	1				1		1				1	I	I	



CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DATUM: Geodetic

DRILLING DATA

Method: Solid Stem Auger

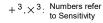
Diameter: 150mm REF. NO.: 19-323-100

Date: Apr-07-2021 ENCL NO.:

BORE	HOLE LOCATION: See Drawing 1 N 4	8099	78.6	45 E 5	98828	.216				11-202						NCL IN	· · ·		
	SOIL PROFILE			SAMPL				DYNA RESIS	MIC CC	NE PE PLOT	NETRA	ATION		NATI	IDAI			_	METHANE
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	ТҮРЕ	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	SHEA O UI	20 4 AR STI NCONF UICK T	0 6 RENG	0 8 TH (kF + L ×	Pa) FIELD V & Sensiti	ANE vity	CON V TER CC	DNTEN	LIQUID LIMIT W _L ——I T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
15 0.0 - 0.2 -	TOPSOIL: 180mm CLAYEY SILT: trace sand, trace gravel, some topsoil/rootlets,		1	SS	4										0	•			
152.2 1 0.8	greyish brown, moist, firm (weathered) SILTY CLAY TILL: trace sand,		2	SS	7	-	152							0					
2	trace gravel, occasional cobble/boulder, brown, moist, firm to hard		3	SS	19		151							o -		40.5	 		1 10 47 42
	grey at 2.3m		4	SS	40									o					
³ 149.9 - 3.1	CLAYEY SILT TILL/SHALE		5	SS	42		150												
- 3.1 	COMPLEX: sandy, trace gravel, occasional cobble/ boulder, reddish brown, moist, hard		J	00	72		149										_		
-148.4 -14 8. 8	SHALE BEDROCK: reddish brown,	1///	6 /	33	50/			-											
4.7	weathered END OF BOREHOLE: Notes: 1) Borehole open and wet upon completion.				<u>25mm</u>														

DS SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16







CLIENT: ARGO Development Corporation

DATUM: Geodetic

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

Date: Apr-07-2021

DRILLING DATA

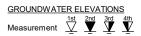
Diameter: 150mm

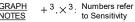
Method: Solid Stem Auger

REF. NO.: 19-323-100

ENCL NO.:

	HOLE LOCATION: See Drawing 1 N 4 SOIL PROFILE			SAMPL				DYNA RESIS	MIC CC	NE PE E PLOT	NETR	ATION		DI AOT	_ NAT	URAL	110/110		F	MET	HANE
(m)		Τ̈́				GROUND WATER CONDITIONS		l					00	PLASTI LIMIT		TURE	LIQUID LIMIT W _L ——I	a) EN	N √	Al	ND
ELEV	DESCRIPTION	STRATA PLOT	m l		BLOWS 0.3 m	NOI	NO.			RENG	TH (kl	Pa)	ANIE	W _P		N 0	W _L	EXE FP	KN/m³	GRAII DISTRI	
EPTH	DESCRIPTION	₹¥	NUMBER	Ж		NO TION	ELEVATION		NCONF		+ L X	FIELD V. & Sensiti	vity ANE	WA ⁻	TER CO	ONTEN	T (%)	§0	NATU.	('	%)
154.6			ĺΝ	TYPE	þ	GR	ELE						00	1	0 2	20 3	30			GR SA	SI
15 9.0 0.2	TOPSOIL: 150mm CLAYEY SILT: trace sand, trace gravel, some topsoil, brown, moist,		1	SS	4		154									0					
0.8	tirm (weathered) CLAYEY SILT TILL/SHALE COMPLEX: sandy, trace gravel,		2	SS	19		104								0						
	occasional cobble/boulder, brown, moist, very stiff to hard		3	ss	26		153								o ⊢					5 18	51
					20															3 10	01 /
151.5			4	SS	39	-	152	<u> </u>							•						
3.1	SANDY SILT TILL: trace clay, some gravel, grey, moist, very dense		5	SS	51/ 130mn	<u> </u> 	151													20 25	43
150.0 14 9.8	SHALE BEDROCK: reddish brown,	. .	6	SS	50/		150	<u> </u>				-						-			
4.8	weathered /		Ť	- 00	51mm	1												t			
	END OF BOREHOLE: Notes:																				
	1) Borehole open and wet upon																				
	completion.																				
														1				1			
			l				l	l	1		1							1	l		







CLIENT: ARGO Development Corporation

PROJECT LOCATION: 3069 Dundas St W, Oakville, ON

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150mm REF. NO.: 19-323-100

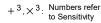
RORFI	M: Geodetic HOLE LOCATION: See Drawing 1 N 4	48101	125 9	21 F 5	98737	948		Date:	Apr-C	7-202	1					ΕN	NCL N	O.:		
JUINE	SOIL PROFILE	.010	1	SAMPL				DYNA RESIS	MIC CC	NE PE	NETR/	ATION		DI *	o NAT	URAL			F	METHANI
(m)		-OT			\(\sigma\)	VATER		2	0 4	0 6	0 8	30 10	00	PLASTI LIMIT W _P	COV	TURE TENT	LIQUID LIMIT W _L	T PEN. <pa)< td=""><td>UNIT W</td><td>AND GRAIN SIZ</td></pa)<>	UNIT W	AND GRAIN SIZ
LEV EPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	0 U ● Q	NCONF	RIAXIAI	+ - ×	FIELD VA & Sensitiv LAB VA	ANE	WA	TER CO	O ONTEN	T (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	
56.4 5 6.0	TOPSOIL: 150mm		2 1	SS	3	00			:0 4	0 6	0 8	80 10	00	1	0 2	20 3	4:			GR SA SI
55.6	CLAYEY SILT: trace sand, trace gravel, some topsoil, brown, moist, soft (weathered)			00			156									0				
8.0	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, brown, moist, very stiff to hard		2	SS	25		155								0					
			3	SS	30										o					
			4	SS	42		154							,	•					
			5	SS	47	-	153								0					
				33	47		100													
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51.6 4.8	pieces of shale at 4.6m SHALE BEDROCK: reddish brown, weathered		6	SS	50/ 25mm									0						
50.5				AS.	50/		151													
	Borehole open and wet upon completion.																			

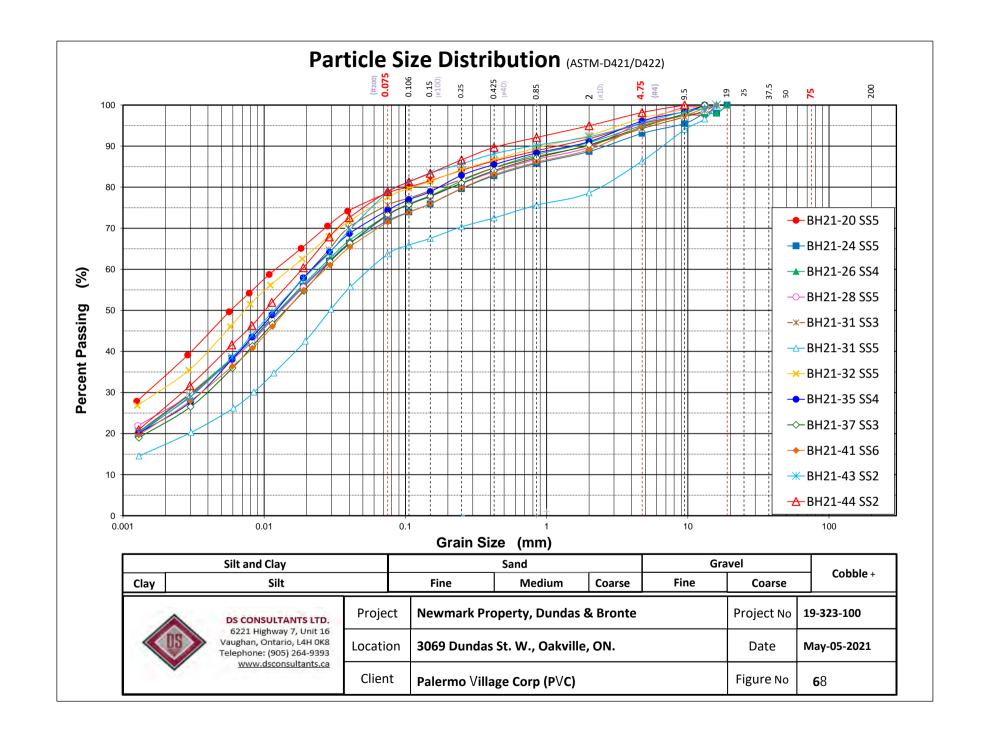


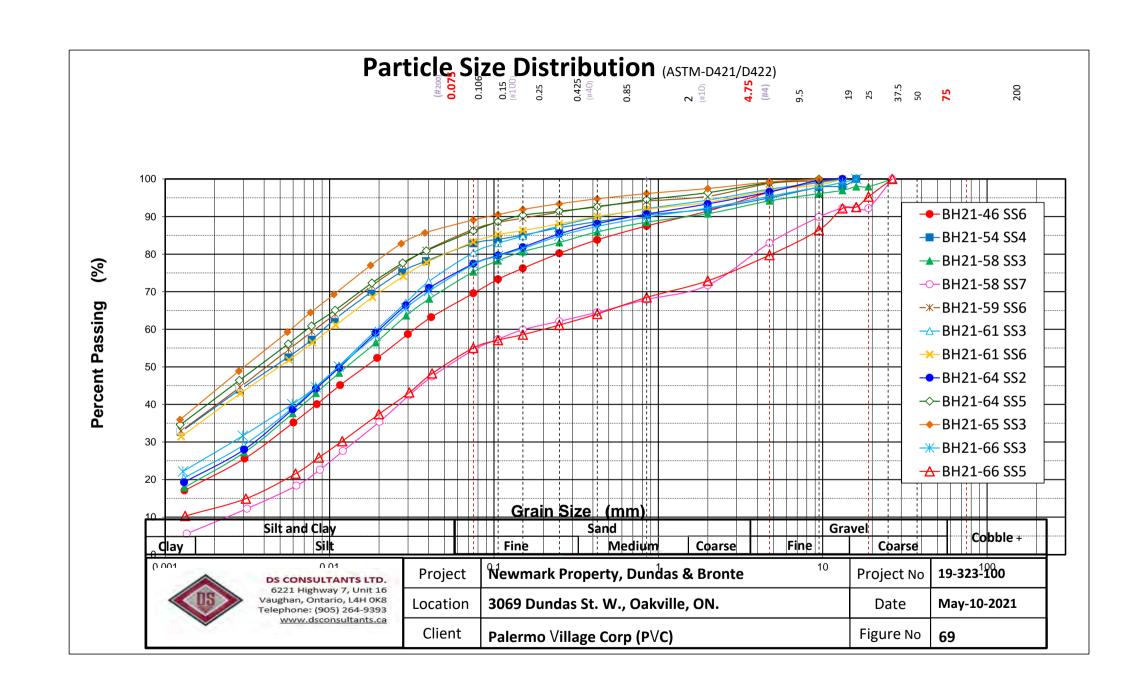
PROJECT: Geotechnical, Hydrogeology Investigation and Phase Two ESA **DRILLING DATA** CLIENT: ARGO Development Corporation Method: Solid Stem Auger PROJECT LOCATION: 3069 Dundas St W, Oakville, ON Diameter: 150mm REF. NO.: 19-323-100 DATUM: Geodetic Date: Apr-05-2021 ENCL NO.: BOREHOLE LOCATION: See Drawing 1 N 4810274.868 E 598069.286 DYNAMIC CONE PENETRATION RESISTANCE PLOT SAMPLES SOIL PROFILE PLASTIC NATURAL MOISTURE CONTENT METHANE GROUND WATER CONDITIONS LIQUID LIMIT POCKET PEN. (Cu) (kPa) AND 40 60 100 NATURAL UNIT (KN/m³) (m) STRATA PLOT GRAIN SIZE BLOWS 0.3 m SHEAR STRENGTH (kPa)
O UNCONFINED + FIELD VANE
& Sensitivity ELEVATION ELEV DEPTH DISTRIBUTION DESCRIPTION NUMBER (%) WATER CONTENT (%) QUICK TRIAXIAL X LAB VANE 60 80 10 20 30 GR SA SI CL 161.1 TOPSOIL: 180mm 16 160.9 SS 3 0 CLAYEY SILT: trace sand, trace gravel, some topsoil, brown, moist, 160.3 soft (weathered) 0.8 CLAYEY SILT TILL: sandy, trace 2 SS 17 160 gravel, occasional cobble/boulder, grey, moist, very stiff to hard Bentonite 3 SS 25 0 159 SS 41 4 o 158 SS 27 5 Filter Pack -Slotted Pipe 50/ SHALE BEDROCK: reddish brown, 6 AS weathered 25mm 156 W. L. 155.9 m Apr 14, 2021 END OF BOREHOLE: 25mm Notes: Borehole open upon completion.
 Water Level Readings: Water Level (mbgl): Date: April 14, 2021 5.17m

SOIL LOG 19-323-100 PALERMO VILLAGE - MARCH 29, 2021-GEO.GPJ DS.GDT 21-6-16

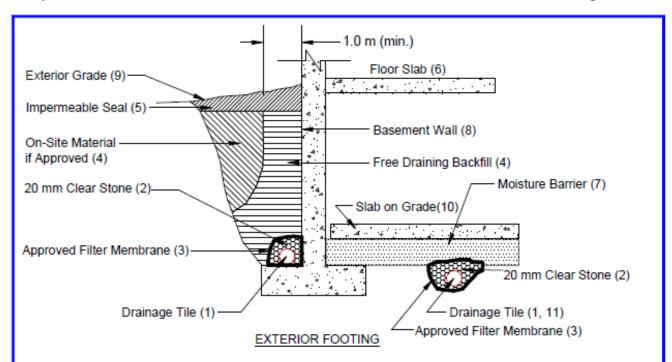
S







Project: 19-323-100 Drawing No. 70



Notes

- Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet.
- 20 mm (3/4") clear stone 150 mm (6") top and side of drain. If drain is not on footing, place 100 mm (4 inches) of stone below drain.
- 3. Wrap the clear stone with an approved filter membrane (Terrafix 270R or equivalent).
- 4. Free Draining backfill OPSS Granular B or equivalent compacted to the specified density. Do not use heavy compaction equipment within 450 mm (18") of the wall. Use hand controlled light compaction equipment within 1.8 m (6') of wall. The minimum width of the Granular 'B' backfill must be 1.0 m.
- Impermeable backfill seal compacted clay, clayey silt or equivalent. If original soil is free-draining, seal may be omitted. Maximum thickness of seal to be 0.5 m.
- Do not backfill until wall is supported by basement and floor slabs or adequate bracing.
- Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors.
- 8. Basement wall to be damp proofed /water proofed.
- Exterior grade to slope away from building.
- Slab on grade should not be structurally connected to the wall or footing.
- Underfloor drain invert to be at least 300 mm (12") below underside of floor slab.
- Drainage tile placed in parallel rows 6 to 8 m (20 to 25') centers one way. Place drain on 100 mm (4") clear stone with 150 mm (6") of clear stone on top and sides. Enclose stone with filter fabric as noted in (3).
- The entire subgrade to be sealed with approved filter fabric (Terrafix 270R or equivalent) if non-cohesive (sandy) soils below ground water table encountered.
- Do not connect the underfloor drains to perimeter drains.
- Review the geotechnical report for specific details.

DRAINAGE AND BACKFILL RECOMMENDATIONS
Basement with Underfloor Drainage

(not to scale)

Appendix A General Comments on Bedrock in Toronto Area

DS Consultants Ltd. December 15, 2020

Project: 19-323-100 Appendix A

General Comments – Bedrock in Greater Toronto Area

The bedrock that makes spread footings or caissons a popular choice for high-rise foundation support is a shale or shale limestone composition. The highest member, the Queenston Formation, is generally found west of Toronto, while the Georgian Bay Formation underlies most of Metro Toronto, with the Collingwood and Whitby Formations east of Toronto. The Queenston is, relatively speaking, the weaker of the four formations that are likely to support caissons or footings.

The Georgian Bay as well as the Queenston and Collingwood/Whitby Formation are of Middle Ordovician Age. It is defined as the rock unit that overlies the bluish grey shales of the Collingwood Formation and is in turn overlain by the red shale of the Queenston Formation. The Georgian Bay Formation consists of bluish and grey shale with interbeds of sandstone, limestone and dolostone. Towards the west where the Georgian Bay formation underlies the Queenston Formation, the limestone content increases significantly and limestone and/or sandstone may comprise as much as 70 to 90 percent of the bedrock. The hard layers are usually less than about 100 to 150 mm thick but some layers are much thicker. The thicker layers have been observed to be as much as 750 to 900 mm at some sites. The layers are actually lenses and they can vary significantly in thickness over short distances.

The upper portion of the bedrock is commonly weathered for a depth of 600 to 1000 mm and within this weathered zone hard limestone layers or lenses are common. These hard limestone layers can result in contractual problems for augers, and can provide misleading bedrock elevations. Where the weathering is more extensive a shale till layer may be found above the bedrock. In the sound bedrock, the limestone, sandstone, dolostone is hard to very hard.

Stress relief features such as folds and faults are common in the bedrock. In these features, the rock is heavily fractured and sheared, and contains layers of shale rubble and clay. Weathering is much deeper than the surrounding rock in these features and often there is a lateral migration of the stress relief features resulting in sound unweathered bedrock overlying fractured and weather bedrock. The stress relief features are usually in the order of 4 to 6 m wide, but the depth can vary from 4 to 5 m to in excess of 10 m. These features occur randomly.

The bedrock contains significant high locked in horizontal stresses. These stresses can impose significant loads on tunnel walls but the slower rate of construction for basements allows for a relaxation of these stresses and they are not normally a problem for basement construction.

Groundwater seepage below the top 1000 mm is generally small, however, at several locations in Toronto and Mississauga large quantities have been encountered.

Bedding joints in the bedrock are very close-to-close, smooth planar in the shale and rough planar in the limestone. Significant vertical jointing is common.

Where the bedrock was cored, a detailed description of the rock core is appended to the borehole log.

Design features related to the bedrock are discussed in other sections of this report, and these general comments must be considered with these comments.

Methane gas exists in the bedrock, normally below the top 1000 mm and more concentrated with depth. Appropriate care and monitoring is essential in all confined bedrock excavations, particularly caissons and tunnels.

Appendix B General Requirements for Engineered Fill

DS Consultants Ltd. December 15, 2020

Project: 19-323-100 Appendix B

GENERAL REQUIREMENTS FOR ENGINEERED FILL

Compacted imported soil that meets specific engineering requirements and is free of organics and debris and that has been continually monitored on a full-time basis by a qualified geotechnical representative is classified as engineered fill. Engineered fill that meets these requirements and is bearing on suitable native subsoil can be used for the support of foundations.

Imported soil used as engineered fill can be removed from other portions of a site or can be brought in from other sites. In general, most of Ontario soils are too wet to achieve the 100% Standard Proctor Maximum Dry Density (SPMDD) and will require drying and careful site management if they are to be considered for engineered fill. Imported non-cohesive granular soil is preferred for all engineered fill. For engineered fill, we recommend use of OPSS Granular 'B' sand and gravel fill material.

Adverse weather conditions such as rain make the placement of engineered fill to the required degree of density difficult or impossible; engineered fill cannot be placed during freezing conditions, i.e. normally not between December 15 and April 1 of each year.

The location of the foundations on the engineered fill pad is critical and certification by a qualified surveyor that the foundations are within the stipulated boundaries is mandatory. Since layout stakes are often damaged or removed during fill placement, offset stakes must be installed and maintained by the surveyors during the course of fill placement so that the contractor and engineering staff are continually aware of where the engineered fill limits lie. Excavations within the engineered fill pad must be backfilled with the same conditions and quality control as the original pad.

To perform satisfactorily, engineered fill requires the cooperation of the designers, engineers, contractors and all parties must be aware of the requirements. The minimum requirements are as follows; however, the geotechnical report must be reviewed for specific information and requirements.

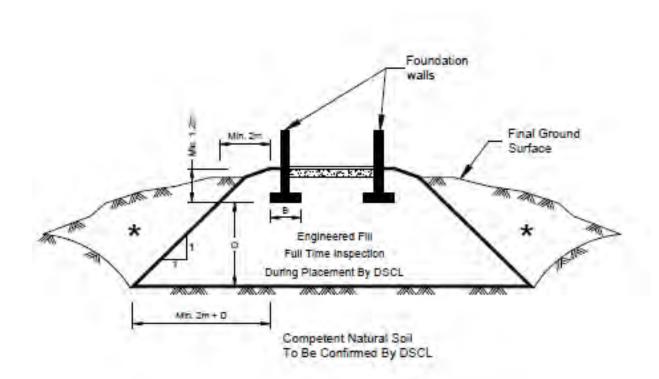
- 1. Prior to site work involving engineered fill, a site meeting to discuss all aspects must be convened. The surveyor, contractor, design engineer and geotechnical engineer must attend the meeting. At this meeting, the limits of the engineered fill will be defined. The contractor must make known where all fill material will be obtained from and samples must be provided to the geotechnical engineer for review, and approval before filling begins.
- 2. Detailed drawings indicating the lower boundaries as well as the upper boundaries of the engineered fill must be available at the site meeting and be approved by the geotechnical engineer.
- 3. The building footprint and base of the pad, including basements, garages, etc. must be defined by offset stakes that remain in place until the footings and service connections are all constructed. Confirmation that the footings are within the pad, service lines are in place, and that the grade conforms to drawings, must be obtained by the owner in writing from the surveyor and DS Consultants Ltd (DSCL). Without this confirmation no responsibility for the performance of the structure can be accepted by DSCL. Survey drawing of the pre and post fill location and elevations will also be required.
- 4. The area must be stripped of all topsoil and fill materials. Subgrade must be proof-rolled. Soft spots must be dug out. The stripped native subgrade must be examined and approved by a DSCL engineer prior to placement of fill.

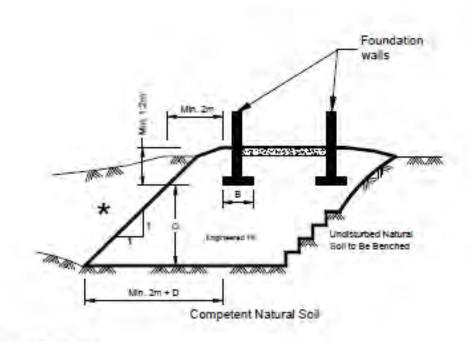
Project: 19-323-100 Appendix B

5. The approved engineered fill material must be compacted to 100% Standard Proctor Maximum Dry Density throughout. Engineered fill should not be placed during the winter months. Engineered fill compacted to 100% SPMDD will settle under its own weight approximately 0.5% of the fill height and the structural engineer must be aware of this settlement. In addition to the settlement of the fill, additional settlement due to consolidation of the underlying soils from the structural and fill loads will occur and should be evaluated prior to placing the fill.

- 6. Full-time geotechnical inspection by DSCL during placement of engineered fill is required. Work cannot commence or continue without the presence of the DSCL representative.
- 7. The fill must be placed such that the specified geometry is achieved. Refer to the attached sketches for minimum requirements. Take careful note that the projection of the compacted pad beyond the footing at footing level is a minimum of 2 m. The base of the compacted pad extends 2 m plus the depth of excavation beyond the edge of the footing.
- 8. A bearing capacity of 150 kPa at SLS (225 kPa at ULS) can be used provided that all conditions outlined above are adhered to. A minimum footing width of 500 mm (20 inches) is suggested and footings must be provided with nominal steel reinforcement.
- 9. All excavations must be done in accordance with the Occupational Health and Safety Regulations of Ontario.
- 10. After completion of the engineered fill pad a second contractor may be selected to install footings. The prepared footing bases must be evaluated by engineering staff from DSCL prior to footing concrete placements. All excavations must be backfilled under full time supervision by DSCL to the same degree as the engineered fill pad. Surface water cannot be allowed to pond in excavations or to be trapped in clear stone backfill. Clear stone backfill can only be used with the approval of DSCL.
- 11. After completion of compaction, the surface of the engineered fill pad must be protected from disturbance from traffic, rain and frost. During the course of fill placement, the engineered fill must be smooth-graded, proof-rolled and sloped/crowned at the end of each day, prior to weekends and any stoppage in work in order to promote rapid runoff of rainwater and to avoid any ponding surface water. Any stockpiles of fill intended for use as engineered fill must also be smooth-bladed to promote runoff and/or protected from excessive moisture take up.
- 12. If there is a delay in construction, the engineered fill pad must be inspected and accepted by the geotechnical engineer. The location of the structure must be reconfirmed that it remains within the pad.
- 13. The geometry of the engineered fill as illustrated in these General Requirements is general in nature. Each project will have its own unique requirements. For example, if perimeter sidewalks are to be constructed around the building, then the projection of the engineered fill beyond the foundation wall may need to be greater.
- 14. These guidelines are to be read in conjunction with DS Consultants Ltd report attached.

Project: 19-323-100 Appendix B





* Backfil in this area to be as per the DSCL report.