



FINAL

Geotechnical Investigation – Proposed Commercial Development

651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, Ontario

Prepared for:

Sobeys Capital Inc.

5935 Airport Road, Suite 810
Mississauga, Ontario L4V 1W5

April 8, 2022

Pinchin File: 298298.002



Issued to: Sobeys Capital Inc.
Issued on: April 8, 2022
Pinchin File: 298298.002
Issuing Office: Mississauga, ON

Author:

Mohamed Y. Bournas, M.A.Sc., E.I.T.
Project Manager, Geotechnical Services
265.822.2032
mbournas@pinchin.com

Reviewer:

Vanessa Marshall, M.Eng., P.Eng.
National Practice Leader, Geotechnical Services
226.808.5335
vmarshall@pinchin.com



TABLE OF CONTENTS

1.0	INTRODUCTION AND SCOPE	1
2.0	SITE DESCRIPTION AND GEOLOGICAL SETTING	2
3.0	CONCURRENT INVESTIGATION.....	2
4.0	GEOTECHNICAL FIELD INVESTIGATION AND METHODOLOGY	2
5.0	SUBSURFACE CONDITIONS.....	4
5.1	Borehole Soil Stratigraphy.....	4
5.1.1	Topsoil and Reworked Soil.....	4
5.1.2	Earth Fill.....	4
5.1.3	Glacial Till	5
5.1.4	Sand	5
5.2	Groundwater Conditions.....	5
6.0	GEOTECHNICAL DESIGN RECOMMENDATIONS	6
6.1	General Information.....	6
6.2	Site Preparation	7
6.3	Open Cut Excavations and Groundwater Management.....	8
6.4	Foundation Design	9
6.4.1	Shallow Foundations Bearing on Native Soils.....	10
6.4.2	Shallow Foundations on Engineered Fill.....	10
6.4.3	Foundation Installation	10
6.4.4	Site Classification for Seismic Site Response & Soil Behaviour	11
6.4.5	Foundation Transition Zones.....	12
6.4.6	Estimated Settlement	13
6.4.7	Building Drainage	13
6.4.8	Shallow Foundations Frost Protection & Foundation Backfill.....	13
6.5	Slab-on-Grade Floors	14
6.6	Asphaltic Concrete Pavement Structure Design for Parking Lot and Driveways.....	14
6.6.1	Discussion	14
6.6.2	Pavement Structure.....	15
6.6.3	Pavement Structure Subgrade Preparation and Granular up Fill.....	15
6.6.4	Drainage	16
7.0	SITE SUPERVISION & QUALITY CONTROL.....	16
8.0	TERMS AND LIMITATIONS	17



FIGURES

FIGURE 1	Key Map
FIGURE 2	Borehole Location Plan (Existing Conditions)
FIGURE 3	Borehole Location Plan (Proposed Conditions)

APPENDICES

APPENDIX I	Abbreviations, Terminology and Principle Symbols used in Report and Borehole Logs
APPENDIX II	Pinchin's Borehole Logs
APPENDIX III	Report Limitations and Guidelines for Use



1.0 INTRODUCTION AND SCOPE

Pinchin Ltd. (Pinchin) was retained by Sobeys Capital Inc. (Client) to conduct a Geotechnical Investigation and provide subsequent geotechnical design recommendations for the proposed commercial development to be located at 651, 659, 665, 669 and 673 Maplevue Drive East, Barrie, Ontario (Site). The Site location is shown on Figure 1.

The following drawings were provided to Pinchin and reviewed in preparation of this report:

- *Phase 2 Site Plan*, Yonge Street & Maplevue Drive East, Barrie, Ontario, Drawing No. A1-27, prepared by Turner Fleischer, dated August 12, 2021; and
- *Site Plan*, Proposed Retail Development, Yonge Street & Maplevue Drive, Barrie, Ontario, prepared by CMV Group Architects, dated December 14, 2021.

It is Pinchin's understanding that the proposed development is to consist of six (6) low-rise slab-on-grade (i.e. no basement level) retail commercial buildings (Buildings "A" to "F"), complete with at-grade asphalt parking lot and access roadways.

Pinchin's geotechnical comments and recommendations are based on the results of the Geotechnical Investigation and our current understanding of the project scope. If the building layout or design should change, Pinchin should be contacted to confirm that the recommendations within the report are still valid.

The purpose of the Geotechnical Investigation was to delineate the subsurface conditions and soil engineering characteristics by advancing a total of twelve (12) sampled boreholes (Boreholes BH1 to BH12), at the Site.

Based on the results of the Geotechnical Investigation, the following geotechnical data and engineering design recommendations are provided herein:

- A review of relevant area geology and Site background information;
- A detailed description of the soil and groundwater conditions;
- Open cut excavations;
- Anticipated groundwater management;
- Foundation design recommendations including soil bearing resistances at Ultimate Limit States (ULS) and Serviceability Limit States (SLS) design;
- Potential total and differential settlements;
- Seismic Site Classification for Seismic Site Response;
- Foundation frost protection and engineered fill specifications and installation;
- Concrete floor slab-on-grade support recommendations;



- Asphaltic concrete pavement structure design for parking areas and access roadways; and
- Potential construction concerns.

Abbreviations terminology and principle symbols commonly used throughout the report, borehole logs and appendices are enclosed in Appendix I.

2.0 SITE DESCRIPTION AND GEOLOGICAL SETTING

The Site is located in the southwest quadrant of the intersection of Yonge Street and Maplevue Drive and consists of an irregularly shaped parcel of land with an area of approximately 1.8 Acres. The Site is currently covered with dense trees and shrubs, and is bounded by Maplevue Drive to the north, Yonge Street to the east, and predominately undeveloped lots to the south and west.

It is understood that the proposed development is to consist of six (6) low-rise slab-on-grade (i.e. no basement level) retail commercial buildings (Buildings “A” to “F”), complete with at-grade asphalt parking lot and access roadways.

Data obtained from the Ontario Geological Survey Maps, as published by the Ontario Ministry of Natural Resources, indicates that the Site is located on coarse-textured glaciolacustrine deposits consisting of sand, gravel, minor silt and clay foreshore and basinal deposits (Ontario Geological Survey 2010, Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release-Data 128-REV). The underlying bedrock at this Site is of Ottawa Group, Simcoe Group and Shadow Lake Formation consisting of limestone, dolostone, shale, arkose, sandstone (Ontario Geological Survey Map 1972, published 1978).

3.0 CONCURRENT INVESTIGATION

Concurrently with this investigation, Pinchin is completing a Hydrogeological Assessment of the proposed development at the Site. The results of Hydrogeological Assessment are provided under a separate cover. The relevant geotechnical information from the above noted report has been included within this report.

4.0 GEOTECHNICAL FIELD INVESTIGATION AND METHODOLOGY

Pinchin completed the field investigations at the Site on November 22 to 26 and December 8 and 9, 2021 by advancing a total of twelve (12) sampled boreholes throughout the Site. The boreholes were advanced to depths of approximately 6.4 and 6.6 meters below ground surface (mbgs). The approximate spatial locations of the boreholes advanced at the Site are shown on Figures 2 and 3.



The boreholes were advanced with the use of Ram Sounder and Big Beaver which was equipped with standard soil sampling equipment. Soil samples were collected at regular intervals using a 51 mm outside diameter (OD) split spoon barrel in conjunction with Standard Penetration Tests (SPT) “N” values (ASTM D1586). The SPT “N” values were used to assess the compactness condition of the non-cohesive soil and to estimate the consistency of the cohesive soil. Groundwater observations and measurements were obtained from the open boreholes during and upon completion of drilling. The in-situ testing, groundwater observations and measurements recorded are included on the appended borehole logs.

Monitoring wells were installed in Boreholes BH1, BH3, BH4, BH6, BH7 and BH9 to BH12 to allow measurement of the groundwater levels. The monitoring wells were constructed using flush-threaded 50 mm diameter Trilock pipe with 3.0 meter long 10-slot well screens, delivered to the Site in pre-cleaned individually sealed plastic bags. The screen and riser pipes were not allowed to come into contact with the ground or drilling equipment prior to installation.

A completed well record was submitted to the Ontario Ministry of the Environment, Conservation and Parks (MECP) as per Ontario Regulation 903, as amended. A licensed well technician must properly decommission the monitoring wells prior to construction according to Regulation 903 of the Ontario Water Resources Act.

The borehole locations and ground surface elevations were surveyed by Pinchin using a Sokkia Model GCX2 Global Navigation Satellite System (GNSS) rover. The ground surface elevations are geodetic, based on GNSS and local base station telemetry with a precision static of less than 20 mm.

The field investigation was monitored by experienced Pinchin personnel. Pinchin logged the drilling operations and identified the soil samples as they were retrieved. The recovered soil samples were sealed into plastic bags and carefully transported to Pinchin's laboratory in Waterloo, Ontario for detailed analysis and testing. All soil samples were classified according to visual and index properties by the project engineer.

The field logging of the soil and groundwater conditions was performed to collect geotechnical engineering design information. The borehole logs include textural descriptions of the subsoil in accordance with a modified Unified Soil Classification System (USCS) and indicate the soil boundaries inferred from non-continuous sampling and observations made during the borehole advancement. These boundaries reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. The modified USCS classification is explained in further detail in Appendix I. Details of the soil and groundwater conditions encountered within the boreholes are included on the Borehole Logs within Appendix II.



5.0 SUBSURFACE CONDITIONS

5.1 Borehole Soil Stratigraphy

The following stratigraphy is based on the borehole findings. The summary provided below is for general guidance only. Detailed depths and elevations are given in the following subsections and appended borehole logs. In general, the three (3) main stratigraphic units are as follows:

- Reworked soil / earth fill materials extending to approximately 0.8 to 2.6 mbgs (i.e. Elevation 265.3 to 269.1 masl), overlying;
- Stiff to hard / loose to compact glacial till deposits, extending to approximately 1.5 to 2.7 mbgs in Boreholes BH1, BH2, BH6 and BH7 (i.e. Elevation 267.4 to 268.1 masl); and
- Very loose to very dense (typically compact to very dense) sand, extending the full depth of the investigation.

5.1.1 Topsoil and Reworked Soil

A topsoil layer was encountered at the ground surface in each borehole. The topsoil ranged from 80 to 200 mm in thickness.

The above topsoil thicknesses were measured from the borehole drilling and are approximate. We recommend that a shallow test pit investigation be carried out to determine precise topsoil thicknesses present across the Site for quantity estimation and costing purposes (if required).

A layer of reworked soil, with trace amounts of organics was encountered beneath the topsoil layer in Boreholes BH4 to BH12 and extended to depths ranging from approximately 0.8 to 2.6 mbgs.

These reworked soils were weathered by natural processes such as frost penetration and were likely disturbed by farming practices.

5.1.2 Earth Fill

Earth fill materials, consisting of gravelly sand and sandy silt, with trace amounts of clay, stone fragments and organics were encountered beneath the topsoil layer in Boreholes BH1 to BH3 and extended to depths ranging from approximately 0.8 to 1.5 mbgs.

The gravelly sand and sandy silt earth fill zones have a loose to compact relative density based on SPT 'N' values of 9 to 13 blows per 300 mm penetration of a split spoon sampler. The in-situ moisture contents of the earth fill samples were generally moist at the time of sampling.

5.1.3 Glacial Till

Sandy silt to silty sand till deposits, with trace to some amounts of clay, trace gravel and stone fragments were encountered beneath the reworked soil and earth fill zone in Boreholes BH1, BH2 and BH6, and extended to depths ranging from approximately 1.5 to 2.7 mbgs.

Clayey silt till deposit, with high amounts of sand (sandy) and trace gravel was encountered beneath the reworked soil in Borehole BH7 and extended to a depth of approximately 1.8 mbgs.

The clayey silt till deposit has a stiff to hard consistency based on SPT 'N' values of 11 and 31 blows per 300 mm penetration of a split spoon sampler.

The cohesionless glacial till deposits have a loose to very dense relative density based on SPT 'N' values of 9 to 52 blows per 300 mm penetration of a split spoon sampler. The in-situ moisture contents of the glacial till samples were generally moist at the time of sampling.

5.1.4 Sand

Sand deposit, with varying amounts of silt (trace silt to silty), trace to some amounts of gravel and trace stone fragments was encountered beneath the reworked soil, earth fill zone and glacial till deposits in each borehole, and extended to the full depth of the investigation.

The sand deposit has a very loose to very dense (typically compact to very dense) relative density based on SPT 'N' values of 3 to more than 50 blows per 300 mm penetration of a split spoon sampler. The in-situ moisture contents of the sand samples were generally moist at the time of sampling.

5.2 Groundwater Conditions

Groundwater observations and measurements were obtained in the open boreholes at the completion of drilling and are summarized on the appended borehole logs. Groundwater levels were measured in the monitoring wells installed in Boreholes BH1, BH3, BH4, BH6, BH7 and BH9 to BH12 on December 15, 2021. The measured groundwater levels are summarized below:

Borehole No.	Depth of Borehole (mbgs)	Water Level Depth (mbgs) / Elevation (masl)	Monitoring Well Screen Interval (mbgs)
		December 15, 2021	
BH1	6.6	dry	3.6 – 6.6
BH3	6.6	dry	3.6 – 6.6
BH4	6.4	dry	3.4 – 6.4
BH6	6.6	dry	2.8 – 5.8



Borehole No.	Depth of Borehole (mbgs)	Water Level Depth (mbgs) / Elevation (masl)	Monitoring Well Screen Interval (mbgs)
		December 15, 2021	
BH7	6.4	dry	3.4 – 6.4
BH9	6.4	dry	2.5 – 5.5
BH10	6.4	dry	3.4 – 6.4
BH11	6.6	dry	3.6 – 6.6
BH12	6.6	dry	3.6 – 6.6

Seasonal variations in the water table should be expected, with higher levels occurring during wet weather conditions in the spring and fall and lower levels occurring during dry weather conditions.

Additional information pertaining to groundwater at the Site is discussed in the hydrogeological report by Pinchin provided under a separate cover.

6.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

6.1 General Information

The recommendations presented in the following sections of this report are based on the information available regarding the proposed construction, the limited results obtained from the geotechnical investigation, and Pinchin's experience with similar projects. Since the investigation only represents a portion of the subsurface conditions, it is possible that conditions may be encountered during construction that are substantially different than those encountered during the investigation. If these situations are encountered, adjustments to the design may be necessary. A qualified geotechnical engineer should be on-Site during the foundation preparation to ensure the subsurface conditions are the same/similar to what was observed during the investigation.

It is understood that the proposed development is to consist of six (6) low-rise slab-on-grade (i.e. no basement level) retail commercial buildings (Buildings "A" to "F"), complete with at-grade asphalt parking lot and access roadways.

A total of twelve (12) boreholes were advanced across the Site. In general, three (3) main stratigraphic units were encountered at the borehole locations and are as follows:

- Reworked soil / earth fill materials extending to approximately 0.8 to 2.6 mbgs (i.e. Elevation 265.3 to 269.1 masl), overlying;

- Stiff to hard / loose to compact glacial till deposits, extending to approximately 1.5 to 2.7 mbgs in Boreholes BH1, BH2, BH6 and BH7 (i.e. Elevation 267.4 to 268.1 masl); and
- Very loose to very dense (typically compact to very dense) sand, extending the full depth of the investigation.

The groundwater table was not encountered in the monitoring wells and therefore the groundwater levels are below the monitoring well termination depth of approximately 6.6 mbgs (i.e Elevation 260.4 masl).

6.2 Site Preparation

The existing topsoil, fill and reworked soil are not considered suitable to remain below the proposed buildings and will need to be removed. The existing inorganic fill can remain below the proposed driveways and parking areas subject to proof rolling, inspection by a geotechnical engineer and any future settlements accepted by the owner.

In calculating the approximate quantity of reworked soil and fill to be stripped, we recommend that the thicknesses provided on the individual borehole logs be increased by 50 mm to account for variations and some stripping of the mineral soil below.

Following removal of the reworked soil and fill materials from the building footprints, the subgrade should be inspected by a qualified geotechnical engineer and any loosened/soft pockets encountered should be sub excavated. Pinchin recommends that engineered fill be compacted in accordance with the criteria stated in the following table:

Type of Engineered Fill	Maximum Loose Lift Thickness (mm)	Compaction Requirements	Moisture Content (Percent of Optimum)
Structural fill to support foundations and floor slabs	200	100% SPMDD	Plus 2 to minus 4
Subgrade fill beneath parking lots and access roadways	300	98% SPMDD	Plus 2 to minus 4

The existing native soils and the inorganic fill material at the Site are suitable for reuse as subgrade fill below the parking lots and access driveways. Any surficial organics should be removed prior to placing road subgrade fill.

It is recommended that any fill required to raise grades below the proposed building comprises of imported Ontario Provincial Standard Specification (OPSS.MUNI) 1010 Granular 'B' Type I or II material. Alternatively, considerations may also be given to the use of natural imported soils as an alternative to OPSS 1010 Granular "B" Type I and II. If the work is carried out during very dry weather, water may have to be added to the material to improve compaction.



The engineered fill should extend for a distance of at least 1 m beyond the edge of foundation, and should extend outwards and downwards from this point at a 1 horizontal to 1 vertical slope, to the approved subgrade. In addition, the engineered fill should extend at least 0.6 m above the proposed foundation elevation. This is to ensure that the foundations are placed on the engineered fill both in plan and elevation.

A qualified geotechnical engineering technician should be on site to observe fill placement operations and perform field density tests at random locations throughout each lift, to indicate the specified compaction is being achieved.

The above noted recommendations are from a geotechnical perspective and additional analytical requirements may need to be reviewed in order to ensure compliance with Ontario Regulation 406/19, *On-Site and Excess Soil Management*, depending on when the material is received at the Site.

6.3 Open Cut Excavations and Groundwater Management

The proposed development consists of six slab-on-grade buildings. The design details and invert elevations of the underground utilities were not available at the time of preparation of this report. It is anticipated that the finished floor level of the proposed slab-on-grade buildings will be constructed close to existing grade and that site services will be installed between 2 and 4 mbgs.

Based on the subsurface information obtained from within the boreholes, the excavated material will consist of reworked soil, earth fill materials, undisturbed glacial till deposits and native sand soil.

Where workers must enter trench excavations deeper than 1.2 m, the trench excavations should be suitably sloped and/or braced in accordance with the Occupational Health and Safety Act (OHSA), Ontario Regulation 213/91, Construction Projects, July 1, 2011, Part III - Excavations, Section 226.

Based on the OHSA, the earth fill materials and native sand soils encountered in the boreholes would be classified as Type 3 soils. Temporary excavations in Type 3 soils must be sloped at an inclination of 1 horizontal to 1 vertical (H to V) from the base of the excavation. The glacial till deposits would be classified as Type 2 soil. Temporary excavations in Type 2 soils may be cut near vertical in the bottom 1.2 m of the excavation and must be trimmed back at an inclination of 1 horizontal to 1 vertical (H to V) above this level.

In addition to compliance with the OHSA, the excavation procedures must also be in compliance to any potential other regulatory authorities, such as federal and municipal safety standards.

The boreholes were dry upon completion of drilling and based on the water level measurements carried out on December 15, 2021, the groundwater table was not encountered in the monitoring wells and therefore the groundwater level is below the monitoring well termination depth of approximately 6.6 mbgs (i.e. Elevation 260.4 masl).



The recommendations for groundwater management within this section should be read in conjunction with the Hydrogeological Assessment Report.

Based on the above information, groundwater table may not be encountered during the excavations. However, perched seepage may be encountered at some locations during the excavation. The groundwater seepage emanating from above the static groundwater table should diminish slowly and can be controlled by continuous pumping from filtered sumps at the base of the excavation.

Seasonal variations in the water table should be expected, with higher levels occurring during wet weather conditions in the spring and fall and lower levels occurring during dry weather conditions. If construction commences during wet periods (typically spring or fall), there is a greater potential that the groundwater elevation could be higher and/or perched groundwater above the clayey silt till deposit may be present. Any potential precipitation or perched groundwater should be able to be controlled from pumping from filtered sumps and should be pumped away immediately (not allowed to pond).

Prior to commencing excavations, it is critical that all existing surface water and potential surface water is controlled and diverted away from the Site to prevent infiltration and subgrade softening. At no time should excavations be left open for a period of time that will expose them to precipitation and cause subgrade softening.

All collected water is to discharge a sufficient distance away from the excavation to prevent re-entry. Sediment control measures, such as a silt fence should be installed at the discharge point of the dewatering system. The utmost care should be taken to avoid any potential impacts on the environment.

It is the responsibility of the contractor to propose a suitable dewatering system based on the groundwater elevation at the time of construction. The method used should not adversely impact any nearby structures.

6.4 Foundation Design

It is understood that the proposed development is to include six low-rise, slab-on-grade buildings. The Site elevations as measured from the borehole locations range from 267.0 to 270.1 masl. The Site grading designs are not available at the time of preparation of this report. The following foundation recommendations are therefore preliminary and are provided for design guidance purposes only.

The existing topsoil, reworked soil and earth fill materials are unsuitable to support the proposed building foundations. Based on the borehole information, shallow foundations may be supported on the native sand and undisturbed glacial till deposits in potential cut areas or imported engineered fill where the Site grade needs to be raised to construct a building pad.



6.4.1 Shallow Foundations Bearing on Native Soils

The existing native compact to very dense sand and stiff to hard / compact to very dense glacial till deposits at the Site are considered suitable to support the proposed building, provided the any organic materials encountered during construction are removed and the subgrade prepared as discussed in Section 5.2, Site Preparation, above.

Conventional shallow strip/spread footings established on native compact to very dense sand and stiff to hard / compact to very dense glacial till deposits may be designed using a bearing resistance for 25 mm of settlement at Serviceability Limit States (SLS) of 250 kPa, and a factored geotechnical bearing resistance of 375 kPa at Ultimate Limit States (ULS).

6.4.2 Shallow Foundations on Engineered Fill

The design grading may require ambient Site grades to be raised in some areas. Consideration should be given to the construction of engineered fill which may also support structure foundations at normal depths.

Conventional shallow strip/spread footings established on engineered structural fill may be designed using a bearing resistance for 25 mm of settlement at SLS of 150 kPa, and a factored geotechnical bearing resistance of 225 kPa at ULS. Site grading plans should be reviewed by Pinchin to better assess the suitability and requirements for engineered fill.

In case of footings supported on engineered fill, the minimum width for the conventional spread strip footing must be 600 mm, and the minimum size of the individual column footing must be 1,000 mm × 1,000 mm, regardless of loading considerations. Furthermore, augured circular footings may be used in the interior of the building footprint in lieu of a poured in place square pad footing and square pier provided the minimum diameter of 1.0 meter is maintained.

In case the building is to be supported partially on engineered fill and partially on competent native soils, a uniform geotechnical bearing resistance of 150 kPa at SLS and factored geotechnical resistance of 225 kPa at ULS should be used. Additional reinforcement in foundations and foundations walls will be required extending to a minimum of 3 m on each side of the transition line.

6.4.3 Foundation Installation

It is noted that there is a potential for weaker subgrade soil to be encountered between the investigation locations. Pinchin presumes that any areas of weaker subgrade soil will consist of small pockets of soft/loose natural soil. Any soft/loose areas are to be removed and replaced with a low strength concrete.

The foundation installations must be reviewed in the field by Pinchin. The on-site review of the condition of the foundation subgrade, as the foundations are constructed, is an integral part of the geotechnical engineering design function, and is not to be considered as third-party inspection services.

The natural subgrade soil is sensitive to change in moisture content and can become loose/soft if subjected to additional water or precipitation. As well, it could be easily disturbed if travelled on during construction. Once it becomes disturbed it is no longer considered adequate to support the recommended design bearing pressures. It is recommended that a working slab of lean concrete (mud slab) be placed in the footing areas immediately after excavation and inspection to protect the founding soils during placement of formwork and reinforcing steel.

In addition, to ensure and protect the integrity of the subgrade soil during construction operations, the following is recommended:

- Prior to commencing excavations, it is critical that all existing surface water, potential surface water and perched groundwater are controlled and diverted away from the work Site to prevent infiltration and subgrade softening. At no time should excavations be left open for a period of time that will expose them to inclement weather conditions and cause subgrade softening;
- The subgrade should be sloped to a sump outside the excavation to promote surface drainage and the collected water pumped out of the excavation. Any potential precipitation or seepage entering the excavations should be pumped away immediately (not allowed to pond);
- The footing areas should be cleaned of all deleterious materials such as topsoil, organics, fill, disturbed, caved materials, or construction debris;
- Any potential large cobbles or boulders (i.e. greater than 200 mm in diameter) within the subgrade material are to be removed and replaced with a similar soil type not containing particles greater than 200 mm in diameter. It is critical that particles greater than 200 mm in diameter are not in contact with the foundation to prevent point loading and overstressing; and
- If the excavated subgrade soil remains open to weather conditions and groundwater seepage, sidewall stability and suitability of the subgrade soil will need to be verified prior to construction.

If construction proceeds during freezing weather conditions, adequate temporary frost protection for the footing bases and concrete must be provided and maintained above freezing at all times.

6.4.4 Site Classification for Seismic Site Response & Soil Behaviour

The following information has been provided to assist the building designer from a geotechnical perspective only. These geotechnical seismic design parameters should be reviewed in detail by the structural engineer and be incorporated into the design as required.

The seismic site classification has been based on the 2012 Ontario Building Code (OBC). The parameters for determination of Site Classification for Seismic Site Response are set out in Table 4.1.8.4.A of the OBC. The site classification is based on the average shear wave velocity in the top 30 m of the site stratigraphy. If the average shear wave velocity is not known, the site class can be estimated from energy corrected Standard Penetration Resistance (N60) and/or the average undrained shear strength of the soil in the top 30 m.

The boreholes advanced at this Site extended to depths ranging from approximately 6.4 to 6.6 mbgs and were terminated in native soils. SPT "N" values within the soil deposits ranged between 3 and greater than 50 blows per 300 mm. As such, based on Table 4.1.8.4.A of the OBC, the Site has been classified as Class C. A Site Class C has an average shear wave velocity (V_s) of between 360 and 760 m/s.

6.4.5 Foundation Transition Zones

Excessive differential settlements can occur where the subgrade support material types differ below the underside of continuous strip footings, (i.e., native soils and engineered fill). As such, where strip footings transition from one material to another the transition between the materials should be suitably sloped or benched to mitigate differential settlements.

Pinchin also recommends the following transition precautions to mitigate/accommodate potential differential settlements:

- For strip footings, the transition zones should be adequately reinforced with additional reinforced steel lap lengths or widened footings;
- Steel reinforced poured concrete foundation walls; and
- Control joints throughout the transition zone(s).

The above recommendations should be reviewed by the structural engineer and incorporated into the design as necessary.

Where strip footings are founded at different elevations, the subgrade soil is to have a maximum slope of 2 H to 1 V, with the concrete footing having a maximum rise of 600 mm and a minimum run of 600 mm between each step, as detailed in the 2012 Ontario Building Code (OBC). The lower footing should be installed first to mitigate the risk of undermining the upper footing.

Individual spread footings are to be spaced a minimum distance of one and a half times the largest footing width apart from each other to avoid stress bulb interaction between footings. This assumes the footings are at the same elevation.



6.4.6 Estimated Settlement

Foundations installed in accordance with the recommendations outlined in the preceding sections are not expected to exceed total settlements of 25 mm and differential settlements of 19 mm.

All foundations are to be designed and constructed to the minimum widths as detailed in the 2012 OBC.

6.4.7 Building Drainage

To assist in maintaining the building dry from surface water seepage, it is recommended that exterior grades around the buildings be sloped away at a 2% gradient or more, for a distance of at least 2.0 m. Roof drains should discharge a minimum of 1.5 m away from the structure to a drainage swale or appropriate storm drainage system.

Exterior perimeter foundations drains are not required, where the finished floor elevation is established a minimum of 150 mm above the exterior final grades or that the exterior gradient is properly sloped to divert surface water away from the buildings.

6.4.8 Shallow Foundations Frost Protection & Foundation Backfill

In the Barrie, Ontario area, exterior perimeter foundations for heated buildings require a minimum of 1.5 m of soil cover above the underside of the footing to provide soil cover for frost protection.

Where the foundations for heated buildings do not have the minimum 1.5 m of soil cover frost protection, they should be protected from frost with a combination of soil cover and rigid polystyrene insulation, such as Dow Styrofoam or equivalent product. If required, Pinchin can provide appropriate foundation frost protection recommendations as part of the design review.

To minimize potential frost movements from soil frost adhesion, the perimeter foundation backfill should consist of a free draining granular material, such as a Granular 'B' Type I or Type II (OPSS 1010) or an approved sand fill, extending a minimum lateral distance of 600 mm beyond the foundation. The existing glacial till deposits are not considered suitable for reuse as foundation wall backfill.

The backfill material used against the foundation must be placed so that the allowable lateral capacity is achieved.

All granular material is to be placed in maximum 300 mm thick lifts compacted to a minimum of 100% SPMDD in hard landscaping areas and 95% SPMDD in soft landscaping areas. It is recommended that inspection and testing be carried out during construction to confirm backfill quality, thickness and to ensure compaction requirements are achieved.

6.5 Slab-on-Grade Floors

It is anticipated that the finished floor level of the proposed slab-on-grade buildings will be constructed close to existing grade. Prior to the installation of the engineered fill material the existing topsoil, reworked soils, earth fill materials, and another organic materials encountered during construction should be removed and the subgrade prepared as discussed in Section 5.2 Site Preparation, above.

Once the subgrade soil is exposed it is to be inspected and approved by a qualified geotechnical engineering personnel from Pinchin to ensure that the material conforms to the soil type and consistency observed during the subsurface investigation work.

Based on the in-situ soil conditions, it is recommended to establish the concrete floor slab on a minimum 200 mm thick layer of Granular “A” (OPSS 1010). Any required up-fill should consist of a Granular “B” Type I or Type II (OPSS 1010).

The installation of a vapour barrier may be required under the floor slab. If required, the vapour barrier should conform to the flooring manufacturer’s and designer’s requirements. Consideration may be given to carrying out moisture emission and/or relative humidity testing of the slab to determine the concrete condition prior to flooring installation. To minimize the potential for excess moisture in the floor slab, a concrete mixture with a low water-to-cement ratio (i.e. 0.5 to 0.55) should be used.

The following table provides the unfactored modulus of subgrade reaction values:

Material Type	Modulus of Subgrade Reaction (kN/m ³)
Granular A (OPSS 1010)	85,000
Granular “B” Type I (OPSS 1010)	75,000
Granular “B” Type II (OPSS 1010)	85,000
Native Glacial Till	30,000
Native Sand	40,000

6.6 Asphaltic Concrete Pavement Structure Design for Parking Lot and Driveways

6.6.1 Discussion

Parking areas and driveway access will be constructed around the proposed building. The native soils and inorganic fill at the Site are considered a sufficient bearing material for an asphaltic concrete pavement structure provided all organics and deleterious materials are removed prior to installing the engineered fill material as discussed in Section 5.2, Site Preparation, above. Any soft/loose pockets will need to be removed and replaced as described below.

6.6.2 Pavement Structure

The following table presents the minimum specifications for a flexible asphaltic concrete pavement structure:

Pavement Layer	Compaction Requirements	Parking Areas	Driveways
Surface Course Asphaltic Concrete HL-3 (OPSS 1150)	92% MRD as per OPSS 310	40 mm	40 mm
Binder Course Asphaltic Concrete HL-8 (OPSS 1150)	92 % MRD as per OPSS 310	50 mm	75 mm
Base Course: OPSS 1010 Granular 'A' material	100% Standard Proctor Maximum Dry Density (ASTM-D698)	150 mm	150 mm
Subbase Course: OPSS 1010 Granular 'B' Type I or II material	100% Standard Proctor Maximum Dry Density (ASTM D698)	300 mm	375 mm

Notes:

- I. Prior to placing the pavement structure, the subgrade soil is to be proof rolled with a smooth drum roller without vibration to observe weak spots and the deflection of the soil; and
- II. The recommended pavement structure may have to be adjusted according to the City of Barrie and/or the Simcoe County standards. Also, if construction takes place during times of substantial precipitation and the subgrade soil becomes wet and disturbed, the granular thickness may have to be increased to compensate for the weaker subgrade soil. In addition, the granular fill material thickness may have to be temporarily increased to allow heavy construction equipment access the Site, in order to avoid the subgrade from "pumping" up into the granular material.

6.6.3 Pavement Structure Subgrade Preparation and Granular up Fill

The proper placement of base and subbase fill materials becomes very important in addressing the proper load distribution to provide a durable pavement structure.

The pavement subgrade materials should be prepared as discussed in Section 5.2, Site Preparation, and thoroughly proof-rolled prior to placement of the subbase course. If any unstable areas are noted, then the thickness of the subbase course may need to be increased to support pavement construction traffic. This should be left as a field decision by a qualified geotechnical engineer at the time of construction, but it is recommended that additional OPSS 1010 Granular 'B' material be carried as a provisional item under the construction contract.

Where fill material is required to increase the grade to the underside of the pavement structure it should consist of imported fill or preferably Granular 'B' Type I or Type II (OPSS 1010). The up fill material is to be placed in maximum 300 mm thick lifts compacted to 98% SPMDD within 4% of the optimum moisture content.



All stockpiled material should be protected from deleterious materials, additional moisture and be kept from freezing.

Post compaction settlement of fine-grained soil can be expected, even when placed to compaction specifications. As such, fill material should be installed as far in advance as possible before finishing the parking lot and access roadways for best grade integrity.

Where the subgrade material types differ below the underside of the pavement structure, the transition between the materials should be sloped as per frost heave taper OPSD 205.60.

Performance grade PG 58-28 asphaltic concrete should be specified for all Marshall mixes.

6.6.4 Drainage

Control of surface water is a critical factor in achieving good pavement structure life. The pavement thickness designs are based on a drained pavement subgrade via sub-drains or ditches.

The native soils at the Site have poor natural drainage and therefore it is recommended that pavement subdrains be installed in the lower areas and be connected to the catch basins.

The surface of the roadways should be free of depressions and be sloped at a minimum grade of 1% in order to drain to appropriate drainage areas. Subgrade soil should slope a minimum of 3% toward stormwater collection points. Positive slopes are very important for the proper performance of the drainage system. The granular base and subbase materials should extend horizontally to any potential ditches or swales.

In addition, routine maintenance of the drainage systems will assist with the longevity of the pavement structure. Ditches, culverts, sewers and catch basins should be regularly cleared of debris and vegetation.

7.0 SITE SUPERVISION & QUALITY CONTROL

It is recommended that all geotechnical aspects of the project be reviewed and confirmed under the appropriate geotechnical supervision, to routinely check such items. This includes but is not limited to inspection and confirmation of the undisturbed natural subgrade material prior to subgrade preparation, pouring any foundations or footings, backfilling, or engineered fill installation to ensure that the actual conditions are not markedly different than what was observed at the borehole locations and geotechnical components are constructed as per Pinchin's recommendations.

Compaction quality control of engineered fill material (full-time monitoring) is recommended as standard practice, as well as regular sampling and testing of aggregates, asphalt, and concrete, to ensure that physical characteristics of materials for compliance during installation and satisfies all specifications presented within this report.



8.0 TERMS AND LIMITATIONS

This Geotechnical Investigation was performed for the exclusive use of Sobeys Capital Inc. (Client) in order to evaluate the subsurface conditions at 651, 659, 665, 669 and 673 Maplevue Drive East, Barrie, Ontario. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practises in the field of geotechnical engineering for the Site. Classification and identification of soil, and geologic units have been based upon commonly accepted methods employed in professional geotechnical practice. No warranty or other conditions, expressed or implied, should be understood. Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations.

Performance of this Geotechnical Investigation to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the subgrade soil at the Site, and recognizes reasonable limits on time and cost.

Regardless how exhaustive a Geotechnical Investigation is performed, the investigation cannot identify all the subsurface conditions. If during construction, subsurface conditions differ from then what was encountered within our test location and the additional subsurface information provided to us, Pinchin should be contacted to review our recommendations. This report does not alleviate the contractor, owner, or any other parties of their respective responsibilities.

This report has been prepared for the exclusive use of the Client and their authorized agents. 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 the third parties. If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time. Please refer to Appendix IV, Report Limitations and Guidelines for Use, which pertains to this report.

Specific limitations related to the legal and financial and limitations to the scope of the current work are outlined in our proposal, the attached Methodology and the Authorization to Proceed, Limitation of Liability and Terms of Engagement which accompanied the proposal.



Geotechnical Investigation – Proposed Commercial Development

651, 659, 665, 669 and 673 Maplevue Drive East, Barrie, Ontario
Sobeys Capital Inc.

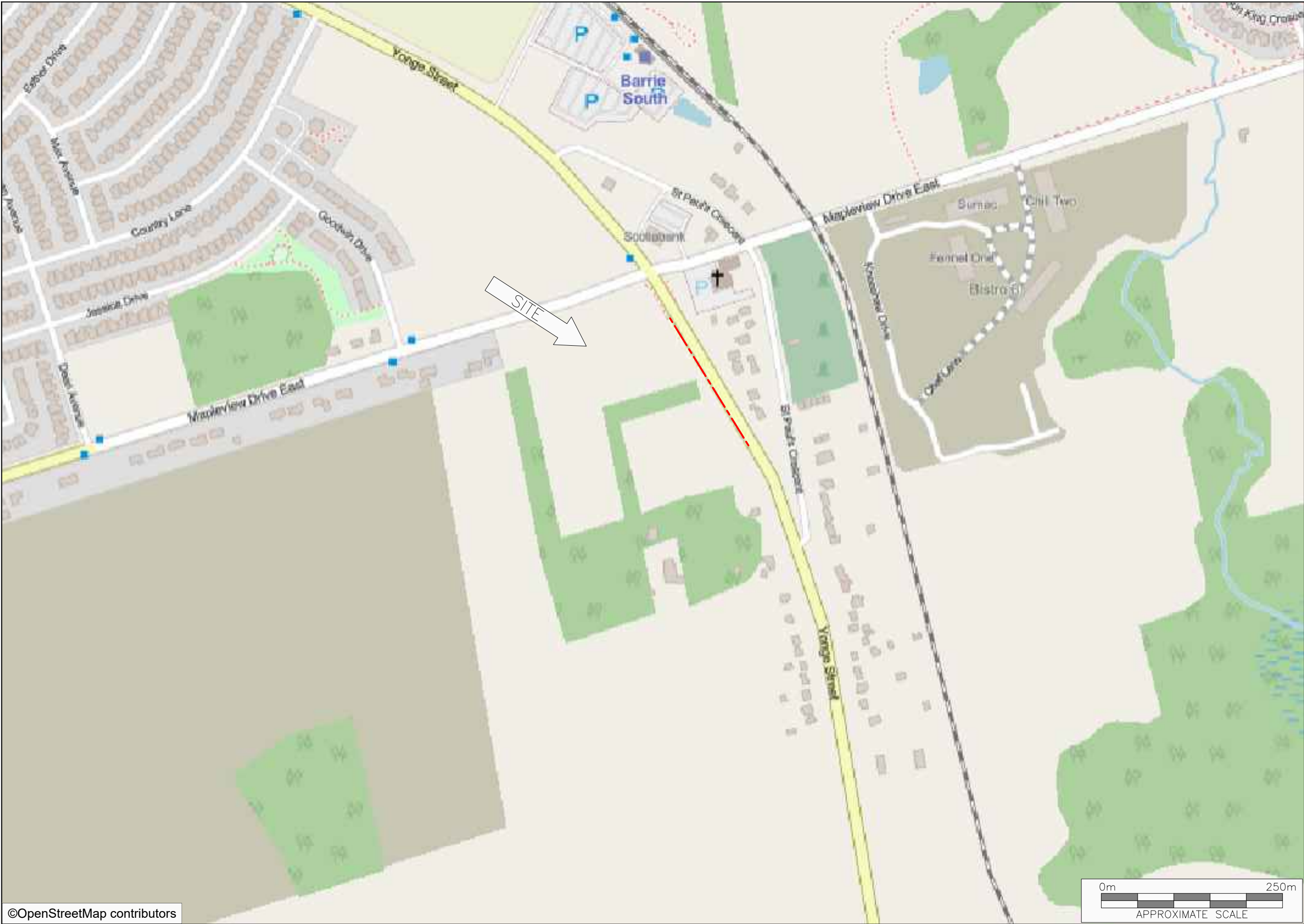
April 8, 2022
Pinchin File: 298298.002
FINAL

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

298298.002 FINAL Geotechnical Investigation Yonge St & Maplevue Dr Barrie ON April 8 2022.docx

Template: Master Geotechnical Investigation Report – Ontario, GEO, April 1, 2020

FIGURES



©OpenStreetMap contributors



LEGEND

LEGEND IS COLOUR DEPENDENT.
NON-COLOUR COPIES MAY ALTER
INTERPRETATION.



PROJECT NAME:
GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL
DEVELOPMENT

CLIENT NAME:

SOBEYS CAPITAL INC.

PROJECT LOCATION:
651, 659, 669 AND 673 MAPLEVIEW DRIVE
EAST, BARRIE, ONTARIO

FIGURE NAME:

KEY MAP

PROJECT NUMBER:
298298.002

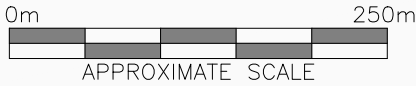
SCALE:
AS SHOWN

DRAWN BY:
SR

REVIEWED BY:
BG

DATE:
DECEMBER 2021

FIGURE NUMBER:
1





LEGEND

- SITE BOUNDARY
- BOREHOLE
- MONITORING WELL

LEGEND IS COLOUR DEPENDENT.
NON-COLOUR COPIES MAY ALTER
INTERPRETATION.

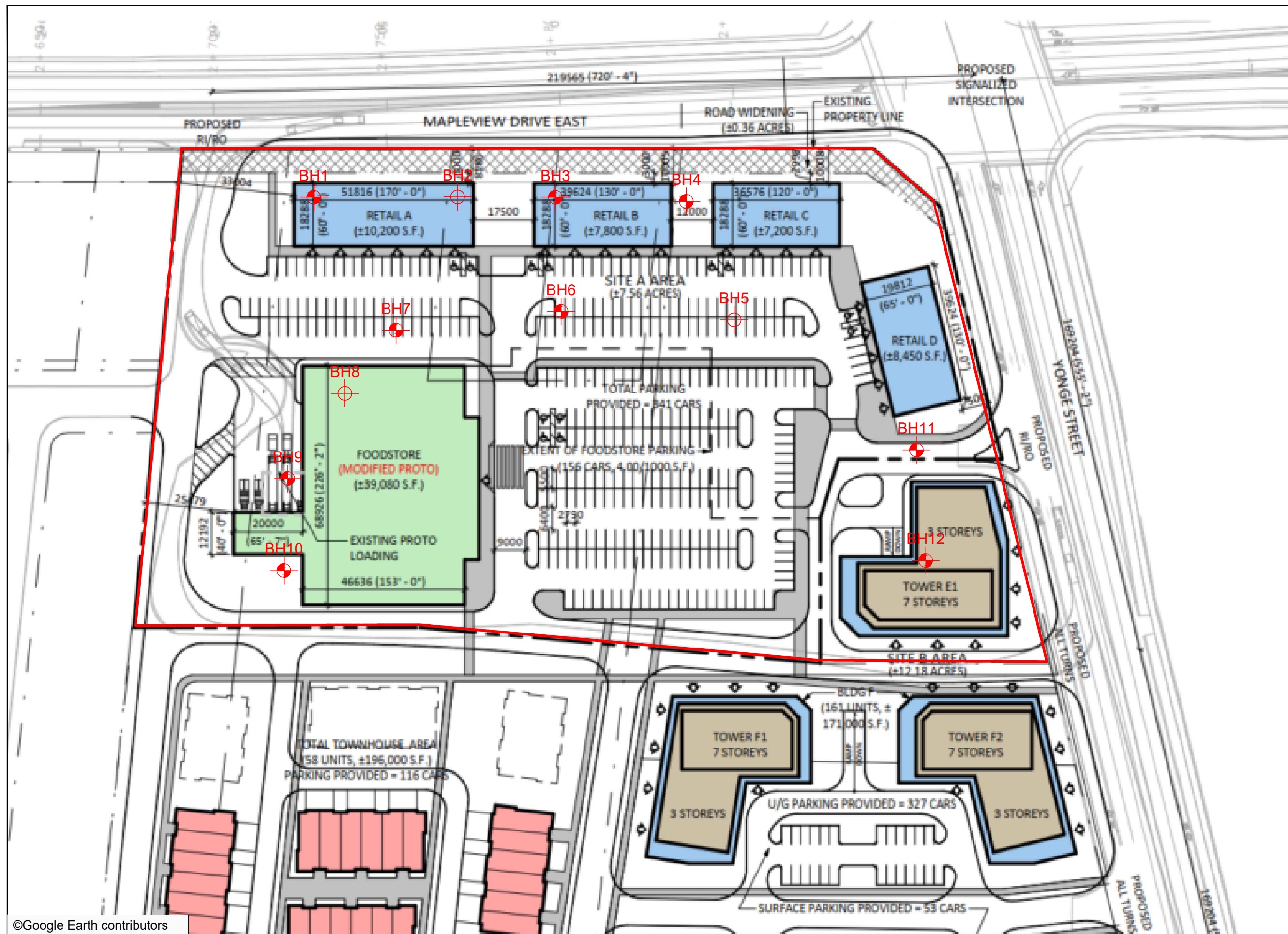
PROJECT NAME:
GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL
DEVELOPMENT

CLIENT NAME:
SOBEYS CAPITAL INC.

PROJECT LOCATION:
651, 659, 665, 669 AND 673 MAPLEVIE
DRIVE EAST, BARRIE, ONTARIO

FIGURE NAME:
BOREHOLE LOCATION PLAN
(EXISTING CONDITIONS)

PROJECT NUMBER: 298298.002	SCALE: AS SHOWN
DRAWN BY: MYB	REVIEWED BY: MYB
DATE: DECEMBER 2021	FIGURE NUMBER: 2



LEGEND

- SITE BOUNDARY
- BOREHOLE
- MONITORING WELL

LEGEND IS COLOUR DEPENDENT.
NON-COLOUR COPIES MAY ALTER
INTERPRETATION.

PROJECT NAME:
GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL
DEVELOPMENT

CLIENT NAME:
SOBEYS CAPITAL INC.

PROJECT LOCATION:
651, 659, 665, 669 AND 673 MAPLEVIEW
DRIVE EAST, BARRIE, ONTARIO

FIGURE NAME:
BOREHOLE LOCATION PLAN
(PROPOSED CONDITIONS)

PROJECT NUMBER: 298298.002	SCALE: AS SHOWN
DRAWN BY: MYB	REVIEWED BY: MYB
DATE: DECEMBER 2021	FIGURE NUMBER: 3

APPENDIX I
Abbreviations, Terminology and Principle Symbols used in Report and
Borehole Logs

ABBREVIATIONS, TERMINOLOGY & PRINCIPAL SYMBOLS USED

Sampling Method

AS	Auger Sample	w	Washed Sample
SS	Split Spoon Sample	HQ	Rock Core (63.5 mm diam.)
ST	Thin Walled Shelby Tube	NQ	Rock Core (47.5 mm diam.)
BS	Block Sample	BQ	Rock Core (36.5 mm diam.)

In-Situ Soil Testing

Standard Penetration Test (SPT), “N” value is the number of blows required to drive a 51 mm outside diameter split barrel sampler into the soil a distance of 300 mm with a 63.5 kg weight free falling a distance of 760 mm after an initial penetration of 150 mm has been achieved. The SPT, “N” value is a qualitative term used to interpret the compactness condition of cohesionless soils and is used only as a very approximation to estimate the consistency and undrained shear strength of cohesive soils.

Dynamic Cone Penetration Test (DCPT) is the number of blows required to drive a cone with a 60 degree apex attached to “A” size drill rods continuously into the soil for each 300 mm penetration with a 63.5 kg weight free falling a distance of 760 mm.

Cone Penetration Test (CPT) is an electronic cone point with a 10 cm² base area with a 60 degree apex pushed through the soil at a penetration rate of 2 cm/s.

Field Vane Test (FVT) consists of a vane blade, a set of rods and torque measuring apparatus used to determine the undrained shear strength of cohesive soils.

Soil Descriptions

The soil descriptions and classifications are based on an expanded Unified Soil Classification System (USCS). The USCS classifies soils on the basis of engineering properties. The system divides soils into three major categories; coarse grained, fine grained and highly organic soils. The soil is then subdivided based on either gradation or plasticity characteristics. The classification excludes particles larger than 75 mm. To aid in quantifying material amounts by weight within the respective grain size fractions the following terms have been included to expand the USCS:

Soil Classification		Terminology	Proportion
Clay	< 0.002 mm		
Silt	0.002 to 0.06 mm	“trace”, trace sand, etc.	1 to 10%
Sand	0.075 to 4.75 mm	“some”, some sand, etc.	10 to 20%
Gravel	4.75 to 75 mm	Adjective, sandy, gravelly, etc.	20 to 35%
Cobbles	75 to 200 mm	And, and gravel, and silt, etc.	>35%
Boulders	>200 mm	Noun, Sand, Gravel, Silt, etc.	>35% and main fraction

Notes:

- Soil properties, such as strength, gradation, plasticity, structure, etcetera, dictate the soils engineering behaviour over grain size fractions; and
- With the exception of soil samples tested for grain size distribution or plasticity, all soil samples have been classified based on visual and tactile observations. The accuracy of visual and tactile observation is not sufficient to differentiate between changes in soil classification or precise grain size and is therefore an approximate description.

The following table outlines the qualitative terms used to describe the compactness condition of cohesionless soil:

Cohesionless Soil	
Compactness Condition	SPT N-Index (blows per 300 mm)
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	> 50

The following table outlines the qualitative terms used to describe the consistency of cohesive soils related to undrained shear strength and SPT, N-Index:

Cohesive Soil		
Consistency	Undrained Shear Strength (kPa)	SPT N-Index (blows per 300 mm)
Very Soft	<12	<2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

Note: Utilizing the SPT, N-Index value to correlate the consistency and undrained shear strength of cohesive soils is only very approximate and needs to be used with caution.

Soil & Rock Physical Properties

General

W	Natural water content or moisture content within soil sample
γ	Unit weight
γ'	Effective unit weight
γ_d	Dry unit weight
γ_{sat}	Saturated unit weight
ρ	Density
ρ_s	Density of solid particles
ρ_w	Density of Water
ρ_d	Dry density
ρ_{sat}	Saturated density e Void ratio
n	Porosity
S_r	Degree of saturation
E_{50}	Strain at 50% maximum stress (cohesive soil)

Consistency

W_L	Liquid limit
W_P	Plastic Limit
I_P	Plasticity Index
W_S	Shrinkage Limit
I_L	Liquidity Index
I_C	Consistency Index
e_{max}	Void ratio in loosest state
e_{min}	Void ratio in densest state
I_D	Density Index (formerly relative density)

Shear Strength

C_u, S_u	Undrained shear strength parameter (total stress)
C'_d	Drained shear strength parameter (effective stress)
r	Remolded shear strength
τ_p	Peak residual shear strength
τ_r	Residual shear strength
ϕ'	Angle of interface friction, coefficient of friction = $\tan \phi'$

Consolidation (One Dimensional)

C_c	Compression index (normally consolidated range)
C_r	Recompression index (over consolidated range)
C_s	Swelling index
m_v	Coefficient of volume change
c_v	Coefficient of consolidation
T_v	Time factor (vertical direction)
U	Degree of consolidation
σ'_{o_0}	Overburden pressure
σ'_p	Preconsolidation pressure (most probable)
OCR	Overconsolidation ratio

Permeability

The following table outlines the terms used to describe the degree of permeability of soil and common soil types associated with the permeability rates:

Permeability (k cm/s)	Degree of Permeability	Common Associated Soil Type
$> 10^{-1}$	Very High	Clean gravel
10^{-1} to 10^{-3}	High	Clean sand, Clean sand and gravel
10^{-3} to 10^{-5}	Medium	Fine sand to silty sand
10^{-5} to 10^{-7}	Low	Silt and clayey silt (low plasticity)
$>10^{-7}$	Practically Impermeable	Silty clay (medium to high plasticity)

Rock Coring

Rock Quality Designation (RQD) is an indirect measure of the number of fractures within a rock mass, Deere et al. (1967). It is the sum of sound pieces of rock core equal to or greater than 100 mm recovered from the core run, divided by the total length of the core run, expressed as a percentage. If the core section is broken due to mechanical or handling, the pieces are fitted together and if 100 mm or greater included in the total sum.

RQD is calculated as follows:

$$\text{RQD (\%)} = \frac{\sum \text{Length of core pieces} > 100 \text{ mm} \times 100}{\text{Total length of core run}}$$

The following is the Classification of Rock with Respect to RQD Value:

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

APPENDIX II

Pinchin's Borehole Logs



Log of Borehole: BH1 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 22, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ° % °	Laboratory Analysis and Comments
0		Ground Surface	270.1								
		Topsoil Approximately 100 mm	0.0								
		Fill Brown gravelly sand, trace silt, loose to compact, moist			SS	1	30	11			
1		Silty Sand Till Brown silty sand till, trace to some clay, trace gravel, trace stone fragments, loose to compact, moist	269.1 1.0		SS	2	25	9			
2					SS	3	70	22			
		Sand Brown sand, trace to some silt, trace to some gravel, compact to dense, moist	267.8 2.3		SS	4	60	21			
3					SS	5	55	33			
4											
		very dense below	265.5 4.6		SS	6	50	>50			
5											

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 270.1 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH1 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 22, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			263.5		SS	7	80	>50						
7		End of Borehole Borehole was terminated at approximately 6.6 mbgs. Borehole was dry and open upon completion of drilling.	6.6											
		Water Level Reading Date Water Depth (mbgs) Dec 15, 2021 dry												
8														
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 270.1 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH2

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 22, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	270.1	No Monitoring Well Installed							
		Topsoil Approximately 125 mm	0.0								
		Fill Brown sandy silt, trace to some gravel, trace clay, trace stone fragments, trace organics, compact, moist	269.3		SS	1	20	13			
1		Brown gravelly sand, trace silt, compact, moist	0.8		SS	2	25	13			
		Sand and Silt Till Brown sand and silt till, trace to some clay, trace gravel, trace stone fragments, compact, moist	268.6		SS	3	60	18			
2		very dense	1.5								
			267.8		SS	4	75	52			
3		Sand Brown sand, trace to some silt, trace gravel, dense to very dense, moist	267.4		SS	5	70	35			
			2.7								
4											
5					SS	6	90	>50			

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 270.1 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: N/A

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH2

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 22, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			263.5	▼	SS	7	100	>50						
7		End of Borehole Borehole was terminated at approximately 6.6 mbgs. Borehole was dry and open upon completion of drilling.	6.6											
8														
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 270.1 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: N/A

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH3 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 23, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	269.6								
		Topsoil Approximately 100 mm	0.0								
		Fill Dark brown gravelly sand, trace to some silt, trace organics, trace stone fragments, compact, moist	268.8		SS	1	25	12			
1		Sand Brown sand, trace silt to silty, trace gravel, trace stone fragments, compact to dense, moist	0.8		SS	2	40	15			
2					SS	3	70	32			
		very dense below	267.3		SS	4	70	51			
3			2.3		SS	5	60	53			
4											
5					SS	6	100	56			

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.6 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH3 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 23, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ° % °	Laboratory Analysis and Comments
6											
			263.0		SS	7	100	66			
		End of Borehole Borehole was terminated at approximately 6.6 mbgs. Borehole was dry and open upon completion of drilling.	6.6								
7		Water Level Reading Date Water Depth (mbgs) Dec 15, 2021 dry									
8											
9											
10											

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.6 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH4 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 24, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	268.8								
		Topsoil Approximately 80 mm	0.0								
		Reworked Soil Dark brown sand, trace to some silt, trace gravel, trace organics, pockets of clayey silt, loose, moist			SS	1	50	7			
1					SS	2	60	7			
			267.3								
		Sand Brown sand, some silt, trace gravel, trace stone fragments, compact to dense, moist	1.5		SS	3	80	13			
2					SS	4	90	29			
3					SS	5	90	49			
4											
			264.2								
		very dense below	4.6		SS	6	95	>50			
5											

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 268.8 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH4 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 24, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			262.4		SS	7	100	>50						
7		End of Borehole Borehole was terminated at approximately 6.4 mbgs. Borehole was dry and open upon completion of drilling. Water Level Reading Date Water Depth (mbgs) Dec 15, 2021 dry	6.4											
8														
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 268.8 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH5

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 25, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	267.5	No Monitoring Well Installed							
		Topsoil Approximately 100 mm	0.0		SS	1	50	4			
		Reworked Soil Dark brown sand, some silt to silty, trace gravel, trace organics, very loose to loose, moist			SS	2	20	6			
1											
			265.6		SS	3	100	3			
			1.9								
2		Sand Brown sand, trace silt to silty, trace gravel, trace stone fragments, very loose, moist	265.2	No Monitoring Well Installed	SS	4	100	15			
		compact to very dense below	2.3								
3					SS	5	100	>50			
4											
					SS	6	100	66			
5											

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 267.5 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: N/A

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH5

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 25, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			260.9	▼	SS	7	100	>50						
7		End of Borehole Borehole was terminated at approximately 6.6 mbgs. Borehole was dry and open upon completion of drilling.	6.6											
8														
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 267.5 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: N/A

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH6 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 24, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	269.6								
		Topsoil Approximately 150 mm	0.0								
		Reworked Soil Dark brown silty sand, some gravel, trace organics, loose, moist	268.8		SS	1	30	7			
1		Sandy Silt Till Brown sandy silt till, some clay, trace gravel, loose, moist	0.8		SS	2	80	9			
		Sand Brown sand, trace to some silt, trace gravel, dense, moist	268.1		SS	3	65	38			
2			1.5		SS	4	50	49			
3		very dense below	266.6		SS	5	95	>50			
4			3.0								
5					SS	6	100	>50			

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.6 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH6 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 24, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			263.0		SS	7	100	>50						
7		End of Borehole Borehole was terminated at approximately 6.6 mbgs; Borehole caved at approximately 4.6 mbgs; Borehole was dry upon completion of drilling.	6.6											
8		Water Level Reading Date Water Depth (mbgs) Dec 15, 2021 dry												
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.6 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH7 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 23, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	269.9								
		Topsoil Approximately 200 mm	0.0 269.7								
		Reworked Soil Dark brown silty sand, trace gravel, trace organics, trace stone fragments, loose to compact, moist	0.2		SS	1	50	9			
1		Clayey Silt Till Brown clayey silt till, sandy, trace gravel, stiff to hard, moist	268.9 1.0		SS	2	70	11			
2		Sand Brown sand, some silt to silty, trace gravel, dense to very dense, moist	268.1 1.8		SS	3	60	31			
3					SS	4	80	36			
4					SS	5	40	>50			
5					SS	6	60	65			

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.9 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH7 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 23, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			263.5		SS	7	90	>50						
		End of Borehole	6.4											
7		Borehole was terminated at approximately 6.4 mbgs. Borehole was dry and open upon completion of drilling.												
		Water Level Reading												
		Date Water Depth (mbgs)												
		Dec 15, 2021 dry												
8														
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.9 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH8

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: December 9, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	269.1	No Monitoring Well Installed							
		Topsoil Approximately 200 mm	0.0 268.9								
		Reworked Soil Dark brown sand, some silt to silty, trace gravel, trace organics, very loose, moist	0.2		SS	1	60	2			
1					SS	2	50	3			
					SS	3	80	31			
2		Sand Brown sand, trace to some silt, trace to some gravel, trace stone fragments, dense to very dense, moist	267.6 1.5		SS	4	100	65			
3											
					SS	5	100	>50			
4											
5					SS	6	100	>50			

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.1 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: N/A

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH8

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: December 9, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			262.5	▼	SS	7	100	>50						
7		End of Borehole Borehole was terminated at approximately 6.6 mbgs. Borehole was dry and open upon completion of drilling.	6.6											
8														
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.1 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: N/A

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH9 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: December 9, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value 20 40 60	Water Content %	Laboratory Analysis and Comments
0		Ground Surface	269.1								
		Topsoil Approximately 200 mm	0.0 268.9								
		Reworked Soil Dark brown to brown sand, trace to some silt, trace to some gravel, trace organics, very loose to compact, moist	0.2		SS	1	40	4			
1					SS	2	50	2			
2					SS	3	70	6			
					SS	4	80	11			
3		Sand Brown sand, trace to some silt, trace gravel, trace stone fragments, compact to very dense, moist	266.5 2.6		SS	5	100	>50			
4					SS	6	100	>50			
5											

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.1 masl

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH9 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: December 9, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			262.7		SS	7	100	>50						
7		End of Borehole Borehole was terminated at approximately 6.4 mbgs. Borehole was dry and open upon completion of drilling. Water Level Reading Date Water Depth (mbgs) Dec 15, 2021 dry	6.4											
8														
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 269.1 masl

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH10 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: December 8, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	267.7								
		Topsoil Approximately 200 mm	0.0 267.5								
		Reworked Soil Dark brown sandy silt, trace gravel, trace organics, loose, moist	0.2		SS	1	50	5			
1		Sand Brown sand, trace to some silt, trace to some gravel, compact to dense, moist	266.9 0.8		SS	2	80	18			
2					SS	3	100	41			
		very dense below	265.4 2.3		SS	4	100	58			
3					SS	5	70	>50			
4					SS	6	100	>50			
5											

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 267.7 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH10 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: December 8, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE										
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content			Laboratory Analysis and Comments
									20	40	60	%			
6			261.3		SS	7	NR	>50							
7		End of Borehole Borehole was terminated at approximately 6.4 mbgs. Borehole was dry and open upon completion of drilling. Water Level Reading Date Water Depth (mbgs) Dec 15, 2021 dry	6.4												
8															
9															
10															

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 267.7 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH11 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 25, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	267.0								
		Topsoil Approximately 180 mm	0.0								
		Reworked Soil Dark brown to brown sand, trace to some silt, trace gravel, trace organics, loose to compact, moist			SS	1	40	4			
1					SS	2	80	4			
			265.3		SS	3	80	23			
2		Sand Brown sand, trace to some silt, trace gravel, trace stone fragments, compact to very dense, moist	1.7		SS	4	85	56			
3					SS	5	100	42			
4					SS	6	75	62			
5											

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 267.0 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH11 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 25, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE								
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content %	Laboratory Analysis and Comments
									20	40	60		
6			260.4		SS	7	100	69					
7		End of Borehole Borehole was terminated at approximately 6.6 mbgs. Borehole was dry and open upon completion of drilling. Water Level Reading Date Water Depth (mbgs) Dec 15, 2021 dry	6.6										
8													
9													
10													

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 267.0 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH12 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 26, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE						
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value □ 20 40 60 □	Water Content ○ % ○	Laboratory Analysis and Comments
0		Ground Surface	267.2								
		Topsoil Approximately 180 mm	0.0								
		Reworked Soil Dark brown sand, trace to some silt, trace gravel, trace organics, very loose to loose, moist			SS	1	50	2			
1					SS	2	80	7			
			265.7								
		Sand Brown sand, trace to some silt, trace gravel, trace stone fragments, compact to very dense, moist	1.5		SS	3	100	16			
2					SS	4	80	40			
3					SS	5	95	70			
4											
5					SS	6	100	68			

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 267.2 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 1 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level



Log of Borehole: BH12 (MW)

Project #: 298298.002

Logged By: HE

Project: Geotechnical Investigation for Proposed Commercial Development

Client: Sobeys Capital Inc.

Location: 651, 659, 665, 669 and 673 Mapleview Drive East, Barrie, ON

Drill Date: November 26, 2021

Project Manager: MYB

SUBSURFACE PROFILE					SAMPLE									
Depth (mbgs)	Graphic Log	Description	Elevation (masl) / Depth (mbgs)	Monitoring Well Details	Sample Type	Sampler Number	Recovery (%)	SPT N-Value	Standard Penetration N-Value			Water Content		Laboratory Analysis and Comments
									20	40	60	%		
6			260.6		SS	7	100	>50						
7		End of Borehole Borehole was terminated at approximately 6.6 mbgs. Borehole was dry and open upon completion of drilling. Water Level Reading Date Water Depth (mbgs) Dec 15, 2021 dry	6.6											
8														
9														
10														

Rig Type: Ram Sounder and Big Beaver

Grade Elevation: 267.2 masl.

Drilling Method: Split Spoon / Solid Stem Auger

Top of Casing Elevation: N/A

Well Diameter: 51 mm

Sheet: 2 of 2

mbgs - meters below ground surface
mbfs - meters below basement floor slab
masl - meters above sea level

APPENDIX III
Report Limitations and Guidelines for Use

REPORT LIMITATIONS & GUIDELINES FOR USE

This information has been provided to help manage risks with respect to the use of this report.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report was prepared for the exclusive use of the Client and their authorized agents, subject to the conditions and limitations contained within the duly authorized work plan. 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 the third parties. If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice.

SUBSURFACE CONDITIONS CAN CHANGE

This geotechnical report is based on the existing conditions at the time the study was performed, and Pinchin's opinion of soil conditions are strictly based on soil samples collected at specific test hole locations. The findings and conclusions of Pinchin's reports may be affected by the passage of time, by manmade events such as construction on or adjacent to the Site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations.

LIMITATIONS TO PROFESSIONAL OPINIONS

Interpretations of subsurface conditions are based on field observations from test holes that were spaced to capture a 'representative' snap shot of subsurface conditions. Site exploration identifies subsurface conditions only at points of sampling. Pinchin reviews field and laboratory data and then applies professional judgment to formulate an opinion of subsurface conditions throughout the Site. Actual subsurface conditions may differ, between sampling locations, from those indicated in this report.

LIMITATIONS OF RECOMMENDATIONS

Subsurface soil conditions should be verified by a qualified geotechnical engineer during construction. Pinchin should be notified if any discrepancies to this report or unusual conditions are found during construction.

Sufficient monitoring, testing and consultation should be provided by Pinchin during construction and/or excavation activities, to confirm that the conditions encountered are consistent with those indicated by the test hole investigation, and to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated. In addition, monitoring, testing and consultation by Pinchin should be completed to evaluate whether or not earthwork activities are completed in

accordance with our recommendations. Retaining Pinchin for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions. However, please be advised that any construction/excavation observations by Pinchin is over and above the mandate of this geotechnical evaluation and therefore, additional fees would apply.

MISINTERPRETATION OF GEOTECHNICAL ENGINEERING REPORT

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having Pinchin confer with appropriate members of the design team after submitting the report. Also retain Pinchin to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having Pinchin participate in pre-bid and preconstruction conferences, and by providing construction observation. Please be advised that retaining Pinchin to participation in any 'other' activities associated with this project is over and above the mandate of this geotechnical investigation and therefore, additional fees would apply.

CONTRACTORS RESPONSIBILITY FOR SITE SAFETY

This geotechnical report is not intended to direct the contractor's procedures, methods, schedule or management of the work Site. The contractor is solely responsible for job Site safety and for managing construction operations to minimize risks to on-Site personnel and to adjacent properties. It is ultimately the contractor's responsibility that the Ontario Occupational Health and Safety Act is adhered to, and Site conditions satisfy all 'other' acts, regulations and/or legislation that may be mandated by federal, provincial and/or municipal authorities.

SUBSURFACE SOIL AND/OR GROUNDWATER CONTAMINATION

This report is geotechnical in nature and was not performed in accordance with any environmental guidelines. As such, any environmental comments are very preliminary in nature and based solely on field observations. Accordingly, the scope of services do not include any interpretations, recommendations, findings, or conclusions regarding the, assessment, prevention or abatement of contaminants, and no conclusions or inferences should be drawn regarding contamination, as they may relate to this project. The term "contamination" includes, but is not limited to, molds, fungi, spores, bacteria, viruses, PCBs, petroleum hydrocarbons, inorganics, pesticides/insecticides, volatile organic compounds, polycyclic aromatic hydrocarbons and/or any of their by-products.

Pinchin will not be responsible for any consequential or indirect damages. Pinchin will only be held liable for damages resulting from the negligence of Pinchin. Pinchin will not be liable for any losses or damage if the Client has failed, within a period of two years following the date upon which the claim is discovered within the meaning of the Limitations Act, 2002 (Ontario), to commence legal proceedings against Pinchin to recover such losses or damage.