



52 Hawkesville Road, St. Jacobs, Ontario

Geotechnical Investigation

Project Location:

52 Hawkesville Road
St. Jacobs, Ontario

Prepared for:

Schlegel Urban Developments
325 Max Becker Drive, Suite 201
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Prepared by:

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Contents

1.0	INTRODUCTION	1
2.0	FIELD AND LABORATORY PROGRAM	1
3.0	SOIL CONDITIONS	2
3.1	Topsoil	2
3.2	Sandy Silt	2
3.3	Sand	2
3.4	Clayey Silt	2
3.5	Glacial Till	3
4.0	GROUNDWATER CONDITIONS	3
5.0	DISCUSSION AND RECOMMENDATIONS	3
5.1	General	3
5.2	Site Preparation	3
5.3	Excavations and Dewatering	4
5.3.1	Pipe Bedding	5
5.3.2	Foundation/Trench Backfilling	5
5.4	Foundation Design	6
5.4.1	Conventional Shallow Footings	6
5.5	Basements	7
5.6	Slab-on-Grade Floors	7
5.7	Pavement Design	8
5.8	Construction Inspection and Testing	9
6.0	LIMITATIONS OF REPORT	10
6.1	Signatures	11

Tables

Table 1: Engineered Fill Requirements	4
Table 2: Recommended Founding Elevation for Conventional Shallow Footings	6
Table 3: Pavement Design	8

Appendices

Appendix A	Figure
Appendix B	Borehole Logs

1.0 INTRODUCTION

MTE Consultants Inc. (MTE) was retained by Schlegel Urban Developments to conduct a geotechnical investigation for the proposed development to be located at 52 Hawkesville Road in St. Jacobs, Ontario. The subject area (the site) currently consists of a vacant field bounded by Hawkesville Road to the south, a railway track to the west, wetlands to the north and a church and residential development to the east as shown on **Figure 1 in Appendix A**.

Based on the provided concept plan, it is understood that the proposed development comprises construction of a new subdivision, including low density residential houses, multi residential and street townhouses, a park, landscaped areas and a stormwater management pond. In addition, municipal services and paved access roads with parking spaces will also be included. It is assumed that the houses will have one level of basement.

The site grades vary from Elevation 348.1 to 345.8 meters above sea level (masl), a grade change of up to 2.3 m.

The purpose of this geotechnical investigation is to determine the soil and groundwater conditions in the area of the proposed residential development and provide geotechnical engineering recommendations for site grading, site servicing, foundations, basements, floor slabs, as well as pavement design and subdrainage requirements.

2.0 FIELD AND LABORATORY PROGRAM

The fieldwork for the investigation was carried out by MTE on September 11, 2023, and involved the drilling of six (6) boreholes, identified as Boreholes BH101-23 to BH106-23. The boreholes were drilled to depths ranging from 5.0 to 6.6 m below ground surface (mbgs).

The locations of the boreholes are shown on the Site Plan, **Figure 1 in Appendix A**

Private and public utility companies were contacted prior to the start of the drilling activities to isolate underground utilities near the boring locations.

The boreholes were advanced using a track mounted drill rig equipped with continuous flight hollow stem augers supplied and operated by London Soil Test Ltd.

Representative soil samples were recovered throughout the depths explored. Standard Penetration Tests (SPT) were carried out during sampling operations in the boreholes using conventional split spoon equipment. Approximate shear strengths of the cohesive deposits were measured with a handheld pocket penetrometer. The SPT N-values and approximate shear strengths recorded are plotted on the borehole logs in **Appendix B**.

Details of the groundwater observations and measurements are provided on the appended borehole logs. Upon completion of the drilling, the boreholes were backfilled with soil cuttings and bentonite in accordance with Ontario Regulation 468/10 (formerly O. Reg. 903) under the provinces Water Resources Act.

The fieldwork was monitored throughout by a member of our geotechnical engineering staff, who directed the drilling procedures; recorded SPT and approximate shear strength values; documented the soil stratigraphies; monitored the groundwater conditions and monitoring well installations; and transported the recovered soil samples to our office for further classification.

The geodetic ground surface elevations at the borehole locations were surveyed by MTE.

The remaining soil samples will be stored for a period of 3 months and will be discarded of at that time without prior request from the client to extend storage time.

3.0 SOIL CONDITIONS

Reference is provided to the appended borehole logs for soil stratigraphy details, SPT N-values, approximate shear strengths, and groundwater observations and measurements. In general, the soil conditions encountered in boreholes typically consisted of topsoil overlying a mix of sandy silt, sand, clayey silt and clayey silt till deposits. The density/consistency of the native soil deposits generally increases with depth. Cobbles were encountered throughout the native soil deposits at the site and should be expected to be encountered during excavations.

The subsurface soil and groundwater conditions were established at the borehole locations only. Subsurface conditions should be expected to vary, in some instances significantly, between and beyond the borehole locations. The stratigraphic boundaries shown on the borehole logs have been inferred from non-continuous sampling and, as such, are approximate and typically represent transitions between soil types and do not necessarily represent exact planes of geological change.

3.1 Topsoil

Topsoil was encountered at the ground surface in all the boreholes. The topsoil ranged in thickness from 175 to 610 mm at the borehole locations (average thickness of 285 mm).

3.2 Sandy Silt

Sandy silt was encountered below the topsoil in Boreholes BH101-23, BH103-23, and BH105-23, and below the topsoil and clayey silt in Borehole BH102-23. The sandy silt deposits extended to the borehole termination depths at Boreholes BH102-23 and BH103-23, and were underlain by a sand deposit at Borehole BH101-23. The sandy silt deposits generally consisted of sandy silt with trace to some clay and gravel. SPT N-values measured in the sandy silt deposits range from 11 to 78 blows per 300 mm penetration of the split spoon sampler, indicating compact to very dense conditions. The sandy silt deposits appeared to be generally moist to very moist at the time of sampling based on visual and tactile examinations.

3.3 Sand

Sand deposits were encountered below the topsoil in Boreholes BH104-23 and BH106-23, and interlayered between the sandy silt and clayey silt till deposits in Borehole BH101-23, extending to depths ranging from 1.2 to 3.0 mbgs. In Borehole BH104-23, an approximately 400 mm thick seam of clayey silt was observed within the sand deposit. SPT N-values measured in the sand deposits range from 6 to 15 blows per 300 mm penetration of the split spoon sampler, indicating loose to compact conditions. The sand deposits appeared to be generally moist to saturated at the time of sampling based on visual and tactile observations.

3.4 Clayey Silt

Clayey silt deposits were encountered below the topsoil, sand, and sandy silt deposits in Boreholes BH102-23, BH104-23, BH105-23, and BH106-23. The clayey silt deposits extended to the borehole termination depths in these boreholes with the exception of Borehole BH102-23, where the clayey silt was underlain by a sandy silt deposit at a depth of 2.3 mbgs. The clayey silt deposits generally consisted of clayey silt with trace to some sand and gravel. Approximate shear strengths measured with a handheld pocket penetrometer of 50 to 225 kPa indicate that the clayey silt has a stiff to hard consistency. The clayey silt appeared to be about the plastic limit to wetter than the plastic limit at the time of sampling, based on visual and tactile observations.

3.5 Glacial Till

A glacial till deposit was encountered below the sand in Borehole BH101-23 at a depth of 3.0 mbgs, and extended to the borehole termination depth. The glacial till deposit consisted of clayey silt, with trace sand and gravel. An approximate shear strength measured with a handheld pocket penetrometer of 200 kPa indicate that the glacial till has a hard consistency. The glacial till material appeared to be about the plastic limit at the time of sampling, based on visual and tactile observations.

4.0 GROUNDWATER CONDITIONS

Groundwater observations and measurements were carried out in the open boreholes at the time of drilling and are summarized on the borehole logs. Saturated conditions were encountered within the sand deposit in Borehole BH101-23 at a depth of 2.2 mbgs (Elevation 345.7 masl). Wet conditions were observed in the sand deposits at a depth of 1.2 mbgs (Elevation 346.7 masl), in Borehole BH104-23.

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations and local variations.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 General

According to the concept plan provided, the proposed development will feature a new subdivision with low-density residential houses, multi-residential/street townhouses, a park, landscaped areas, and a stormwater management pond. Additionally, the project will include municipal services, paved access roads, and parking spaces. It is anticipated that the houses will have one level of basement.

This section of the report provides geotechnical engineering recommendations for the preliminary design of the project. These recommendations are intended for use by the project designers and are based on our interpretation of the factual information obtained. Where comments are made related to construction, they are provided to draw attention to aspects that could affect the design. Contractors bidding on or carrying out the work should make their own interpretation of the factual information contained in this report and make their own interpretation of that information to assess how it may affect means and methods, equipment selection, staging, costing and the like.

Based on the results of this geotechnical investigation the site is suitable for the proposed development. The following subsections of this report contain geotechnical recommendations and comments for site grading, site servicing, foundations, basements, floor slabs, as well as pavement design and subdrainage requirements.

5.2 Site Preparation

Prior to placement of foundations and/or engineered fill, all surficial topsoil, organics, vegetation and/or otherwise deleterious materials should be stripped and removed. The average depth of topsoil encountered in the boreholes was 285 mm. It is recommended that the average depth of topsoil should be increased by 50 to 100 mm when calculating stripping volumes to account for uncertainty and overstripping. The topsoil could be used in landscaping areas to raise grades.

It is noted that the movement of excess soil from a project site is regulated under O.Reg. 406/19 and the associated Rules for Soil Management and Excess Soil Quality Standards. The Regulation and Rules have been enacted with various phases in dates between January 2021 and 2025. Depending on the proposed timing and final design of the project, excess soil management may be captured under the Regulation and associated Rules.

The subgrade should be inspected and proof rolled in the presence of a qualified geotechnical personnel to verify if the subgrade will provide support as intended in the original design. The primary purpose of the inspection is to identify poorly performing areas which should be sub-excavated.

Due to the relatively flat topography of the site, it is not expected that large grading operations will be required. Any structural fill used for raising grades beneath the proposed buildings, should comprise granular material such as OPSS 1010 Granular 'B', if required. Subgrade fill material beneath any pavement areas and services should meet the requirements of OPSS 1010 Select Subgrade Material. Any imported fill should be tested and verified by qualified geotechnical personnel prior to the placement.

If the existing native soils or imported fine grained materials are utilized as engineered fill at the site, the moisture content of the materials will need to be closely monitored to ensure proper compaction is able to be achieved. Additionally, the lift thicknesses may need to be reduced to a thickness 150 to 200 mm to ensure proper compaction is achieved.

Structural fill pads should extend a minimum 0.5 m beyond the edge of the footing envelope of any building and down to subgrade at an angle of 45 degrees to the horizontal. Full time testing by geotechnical personnel is required during fill placement and compaction to monitor material quality, lift thickness, and verify the compaction by in-situ density testing (as per the 2012 Ontario Building Code).

All engineered fill should be placed in maximum 300 mm thick lifts and compacted to the following percentages:

Table 1: Engineered Fill Requirements

Fill Use	Minimum Compaction Required
Engineered fill to support buildings	100% SPMDD
Subgrade fill beneath pavements or services	98% SPMDD
Bulk fill in landscape areas	90% SPMDD

The native subgrade soils are susceptible to disturbance, and it is recommended that construction traffic on the subgrade be minimized. To minimize the effects of weather and groundwater, fill operations onsite should be carried out in the dry summer months.

5.3 Excavations and Dewatering

All excavations at the site should be carried out in conformance with the Ontario Occupational Health and Safety Act and Regulations for Construction Projects. The predominant compact/stiff soils encountered at the site are classified as Type 3 soils, and temporary side slopes through this material must be cut at an inclination of 1.0 horizontal to 1.0 vertical or less from the base of the excavation, exclusive of groundwater effects. The very dense or hard native soils at depth may be classified as Type 2 soils. Temporary excavation sidewalls which extend through and terminate solely within Type 2 soil may be cut vertically in the bottom 1.2 m (4 ft.) and cut back at an inclination of 1 horizontal to 1 vertical above that level. Where wet or saturated conditions are encountered, excavation side slopes should be expected to slough to flatter inclinations, potentially 3.0 horizontal to 1.0 vertical or flatter.

Trench side slopes must be continuously inspected especially after periods of heavy rainfall or snow melt to identify areas of instability. Surface water should be directed away from entering the trench. It will be necessary to flatten or support the excavation side slopes should groundwater seepage occur to ensure stability. Every excavation that a worker may be required to enter shall be kept reasonably free of water (O. Reg. 213/91, s. 230).

As mentioned above, shallow groundwater was observed during the drilling only in BH101-23 at a depth of 2.2 mbgs (Elevation 345.7 masl) and some wet conditions in the sand deposits were encountered in BH104-23 at a depth of 1.2 mbgs (Elevation 346.7 masl). Based on the groundwater conditions encountered during the drilling, no significant groundwater seepage is anticipated. However, minor groundwater inflow from the native soil deposits may be encountered during excavations for basements/services at the site. In the event of minor groundwater seepage, it is envisioned that conventional sump pump techniques will be adequate to control the inflow.

Moderate to significant water inflow maybe anticipated if excavations extend below the stabilized groundwater level and a more extensive dewatering system may be required to lower the groundwater level during construction.

5.3.1 Pipe Bedding

It is understood that the proposed buildings will require the installation of new services, and the invert elevation of the services will be at conventional depths of about 2 to 3 mbgs.

No bearing problems are anticipated for pipes set on native inorganic subsoil or imported structural fill. However, if excavation encounters minor seepage, water inflow, or soft/spongy soil at the bottom of the service trench, the bedding material may need to be thickened.

Pipe bedding for sewer services should be conventional Class 'B' pipe bedding comprising a minimum 150 mm thick layer of OPSS 1010 Granular 'A' aggregate below the pipe invert. Granular 'A' type aggregate should be provided around the pipe to at least 300 mm above the pipe and the bedding aggregate should be compacted to a minimum 100% Standard Proctor Maximum Dry Density (SPMDD), as per the Region of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services Document (DGSSMS), dated February 2024.

A well-graded clear stone such as Coarse Aggregate for HL4 Asphaltic Concrete (OPSS 1003) could be used in the sewer trenches as bedding below the spring line of the pipe to facilitate sump pump dewatering, if necessary. The clear stone should be compacted with a plate tamper and fully wrapped with a non-woven filter cloth to prevent the migration of fine particles from the saturated soils.

5.3.2 Foundation/Trench Backfilling

In general, the native soils, if not excessively saturated, excavated from the foundation areas will be suitable for reuse as foundation backfill. Any wet native soils excavated from the foundation areas will not be suitable for reuse as foundation backfill and imported OPSS 1010 Granular 'B' material would need to be used.

The backfill should be placed in maximum 300 mm thick lifts and compacted to at least 95% Standard Proctor Maximum Dry Density (SPMDD) for exterior landscaped areas, 98% SPMDD for exterior hardscaped areas; and 100% SPMDD on the interior of the buildings. The backfill must be brought up evenly on both sides of walls not designed to resist lateral earth pressure.

The trenches above the specified pipe bedding should be backfilled with inorganic onsite soils placed in 300 mm thick lifts and compacted to at least 98% SPMDD. Where trenches enter the proposed building, the backfill should be compacted to 100% SPMDD or 5 MPa lean-mix concrete may be used. Wet or saturated native soils are not considered suitable for reuse as trench backfill. Any additional material required to be imported at the site should meet OPSS Select Subgrade Material specifications.

To minimize potential problems, backfilling operations should follow closely after excavation so that only a minimal length of trench is exposed. Care should be taken to protect side slopes of excavations by diverting surface run-off away from the excavations. If construction extends into the winter, then additional steps should be taken to minimize frost and ensure that frozen material is not used as backfill.

5.4 Foundation Design

5.4.1 Conventional Shallow Footings

It is anticipated that the proposed street townhouses and low-density residential structures will be constructed with conventional strip and/or pad footings.

In general, the undisturbed compact or stiff native soils or engineered structural fill are considered suitable to support the proposed building foundations.

The following table provides the minimum recommended depth and elevation for the footing placement on competent native soils and/or approved structural fill for a factored geotechnical bearing resistance at Ultimate Limit States (ULS) of 225 kPa, and soil bearing resistance for 25 mm of settlement at Serviceability Limit States (SLS) of 150 kPa.

Table 2: Recommended Founding Elevation for Conventional Shallow Footings

Borehole Number	Ground Surface Elevation (masl)	Depth to Competent Subgrade (mbgs)	Elevation of Competent Subgrade (masl)
BH101-24	347.9	1.8	346.1
BH102-24	346.1	1.5	344.6
BH103-24	345.8	0.8*	345.0
BH104-24	347.9	1.5	346.4
BH105-24	347.2	2.3	344.9
BH106-24	348.1	1.2	346.9

*All exterior floor slabs and footings in unheated areas must be provided with a minimum 1.2 m of earth cover

The founding soils are susceptible to disturbance by construction activity, especially during wet weather and care should be taken to preserve the integrity of the material as bearing strata. A mud slab of lean mix concrete is recommended if the foundations cannot be poured during the same day as excavation.

The footing areas must be inspected by qualified geotechnical personnel to ensure that the soil conditions encountered at the time of construction are suitable to support the design resistances prior to pouring concrete. Any loose, disturbed, organic and deleterious material identified during the inspection should be removed from the footing areas and replaced with concrete.

All exterior floor slabs and footings in unheated areas must be provided with a minimum 1.2 m of earth cover or equivalent insulation after final grading to minimize the potential of damage due to frost action, as per Ontario Provincial Standard Drawing, OPSD 3090.101, dated November 2010. If construction is undertaken during the winter, the subgrade soil and concrete should be protected from freezing.

Where spread footings are constructed at different elevations, the difference in elevation in the individual footing should not be greater than one half of the clear distance between the footings. The lower footing should be constructed first so that if it is necessary to construct the lower footings at a greater depth than anticipated, the elevation of the upper footings can be adjusted accordingly. Stepped strip footings should be constructed in accordance with OBC Section 9.15.3.9.

A Site Classification 'D' should be used for earthquake load and effects in accordance with Table 4.1.8.4.-B of the 2024 Ontario Building Code.

5.5 Basements

Basements at this site must be provided with perimeter weeping tile systems as per the Ontario Building Code (Section 9.14). The drain tile or pipe should be laid on undisturbed or well compacted soil so that the top of the tile or pipe (minimum 100 mm diameter) is below the bottom of the basement floor slab. The top and sides of the drain tile or pipe shall be surrounded with not less than 150 mm of crushed stone or other clean coarse granular material containing no more than 10% of material that will pass the 4 mm sieve. The crushed stone should be wrapped with filter cloth. The weeping tile must drain to a suitable frost-free outlet or sump equipped with an automatic pump that will discharge water into a storm sewer service or other frost-free outlet.

The portion of the exterior basement walls and floor slabs below finished ground level must be waterproofed as per the Ontario Building Code (Subsection 9.13.3). Free-draining sand materials should be used for basement wall backfill. The basement wall backfill should be graded to allow drainage away from the foundation.

Assuming that the retained soil is free-draining and the backfill is drained to the base of the wall, the earth pressure acting on basement walls at any depth (h) may be computed using the following expression:

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

where:

- p = lateral earth pressure in kPa acting at a depth h ;
- K = earth pressure coefficient, assumed to be 0.4 to 0.5;
- γ = unit weight of backfill, a value of 20.4 kN/m³ may be assumed;
- h = depth to point of interest in m; and
- q = equivalent value of any surcharge on the ground surface.

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

5.6 Slab-on-Grade Floors

The floor slabs can be constructed using conventional concrete slab-on-grade techniques, following removal of any topsoil and organic soils, and inspection of the subgrade soils.

Fill material required to raise grades below the floor slab should be compacted to 100% SPMDD. A minimum 150 mm thick layer of Granular 'A' material uniformly compacted to 100% SPMDD should be provided directly beneath the slab for leveling and support purposes.

A modulus of subgrade reaction of 20 to 30 MPa/m should be used in the design of the floor slabs.

No special underfloor drains are required, provided the exterior grades are lower than the floor slabs and positively sloped away from the buildings.

If a moisture-sensitive floor finish is to be applied to the slab, then we recommend that a 15 mil polyethylene moisture vapour barrier be installed directly beneath the slab as per Article 9.13.2.6 of the Ontario Building Code. The purpose of the vapour barrier is to reduce moisture transfer by diffusion as per Article 5.5.1.2 of the Ontario Building Code. Joints in the vapour barrier should be lapped not less than 100 mm.

The water to cement ratio and slump of the concrete utilized in the floor slab should be strictly controlled to minimize shrinkage of the slab. Control joints should be sawed into the slabs at regular intervals within 12 hours of initial concrete placement to pre-locate shrinkage cracks.

Concrete testing should be performed on-site to determine the slump, temperature, and air entrainment, and concrete cylinders should be cast for compressive strength testing

5.7 Pavement Design

Any existing topsoil, organics and other deleterious materials should be removed from the proposed pavement areas. Depending on finished grades at the site, the subgrade soils will consist of native soils or approved engineered fill.

The pavement component thicknesses in the following table are recommended based on the proposed pavement usage and the frost-susceptibility and strength of the subgrade soils:

Table 3: Pavement Design

Pavement Component	Light Duty Areas	Heavy Duty Areas
Asphalt Hot Mix	90 mm	120 mm
OPSS 1010 Granular 'A' Base	150 mm	150 mm
OPSS 1010 Granular 'B' Subbase	300 mm	400 mm

Samples of aggregates should be checked for conformance to OPSS 1010 prior to utilization on site and during construction. The Granular 'B' subbase and Granular 'A' base courses must be compacted to 100% SPMDD, as verified by insitu density testing.

The asphaltic concrete paving materials should conform to the requirements of OPSS 1150. The asphalt should be placed and compacted in accordance with OPSS 310. The Performance Graded Asphalt Cement (PG-AC) designation for the asphaltic concrete is 58-28.

The asphaltic concrete should comprise 40 mm of the HL3 surface over 50 mm of HL4 or HL8 binder for light duty areas and 40 mm of HL3 surface over 80 mm of HL4 or HL8 binder for heavy duty areas.

The pavement design is based on the assumption that the construction will be carried out during the drier time of the year and that the subgrade soil is stable as determined by proof-rolling inspected by qualified geotechnical personnel. If the subgrade is wet and unstable, additional granular subbase will be required.

All materials and construction services required for the work should be in accordance with the relevant sections of the Ontario Provincial Standard Specifications.

It is recommended to install subdrains beneath the low-lying areas of the pavement structure and connect them to catch basins. The purpose of the subdrains is to remove excess subsurface water in order to improve overall pavement serviceability and increase the pavement life.

The work of subdrain installation shall be in accordance with OPSS 405 and OPSD 216.021. The subdrain shall be 150 mm diameter perforated pipe conforming to OPSS 1801 or 1840 and wrapped with geotextile conforming to OPSS 1860.

5.8 Construction Inspection and Testing

MTE recommends that geotechnical inspection and testing procedures be conducted throughout the various phases of the potential project.

Engineer site visits should be conducted to confirm geotechnical bearing resistances for footings. Soil compaction testing should be carried out on structural fill beneath the proposed building addition, foundation wall backfill, sub slab granular fill, and trench backfill. Laboratory and field testing of the pavement structure components (granulars and asphaltic concrete) should be conducted, as well as concrete testing for foundations, curbs and sidewalks.

MTE offers soil compaction, concrete, and asphalt testing, as well as soil inspection services through our Kitchener, Stratford, and London offices.

6.0 LIMITATIONS OF REPORT

Services performed by MTE Consultants Inc. (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Geotechnical Engineering & Consulting profession practicing under similar conditions in the same geographic area where the services are provided. No other warranty or representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

This report was completed for the sole use of the Client. This report is not intended to be exhaustive in scope or to imply a risk-free site. As such, this report may not deal with all issues potentially applicable to the site and may omit aspects which are or may be of interest to the reader.

In addition, it should be recognized that a soil sample result represents one distinct portion of a site at the time it is collected, and that the findings of this report are based on conditions as they existed during the time period of the investigation. The material in the report reflects our best judgment using the information available at the time the report was written. The soil and groundwater conditions between and beyond the test holes may differ from those encountered in the test holes. Should subsurface conditions arise that are different from those in the test holes MTE should be notified to determine whether or not changes should be made as a result of these conditions.

It should be recognized that the passage of time may affect the views, conclusions and recommendations (if any) provided in this report because groundwater conditions of a property can change, along with regulatory requirements. All design details were not known at the time of submission of this report and it is recommended MTE should be retained to review the final design documents prior to construction to confirm they are consistent with our report recommendations. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may determine whether it affects the contents of this report.

Any use which another party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such parties. MTE accepts no responsibility for liabilities incurred by or damages, if any, suffered by another party as a result of decisions made or actions taken, based upon this report. Others with interest in the site should undertake their own investigations and studies to determine how or if the condition affects them or their plans. The contractors bidding on this project or undertaking the construction should make their own interpretation of the factual information and draw their own conclusions as to how subsurface conditions may affect their work.

The benchmark and elevations provided in this report are primarily established to identify differences between the test hole locations and should not be used for other purposes such as, planning, development, grading, and excavation.

6.1 Signatures

All of which is respectfully submitted,

MTE Consultants Inc.



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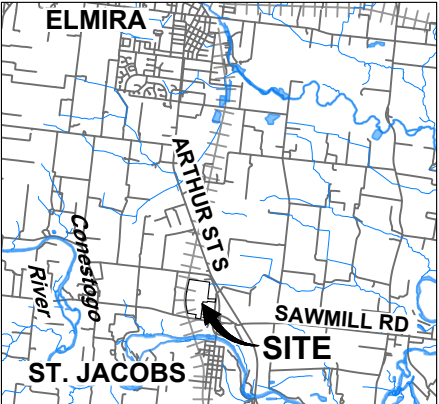
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Appendix A

Figure



KEY PLAN (nts)

LEGEND

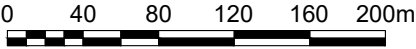
- SITE
- ⊕ BOREHOLE
- (346.1m) ELEVATION (m AMSL)

REFERENCES

SOUTHWESTERN ONTARIO ORTHOPHOTOGRAPHY PROJECT (2015), SOURCE: DATA PROVIDED BY ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY, © COPYRIGHT: 2024 KING'S PRINTER OF ONTARIO, ALL RIGHTS RESERVED; LAND INFORMATION ONTARIO, ROAD AND WATER NETWORK © KINGS PRINTER FOR ONTARIO, 2024 (key plan); AND DEVELOPMENT CONCEPT, SCHLEGEL- ST JACOBS SUBDIVISION, BY GSP GROUP

NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.
ALL LOCATIONS ARE APPROXIMATE.





Engineers, Scientists, Surveyors

PROJECT

GEOTECHNICAL INVESTIGATION
52 HAWKESVILLE ROAD
ST. JACOBS, ONTARIO

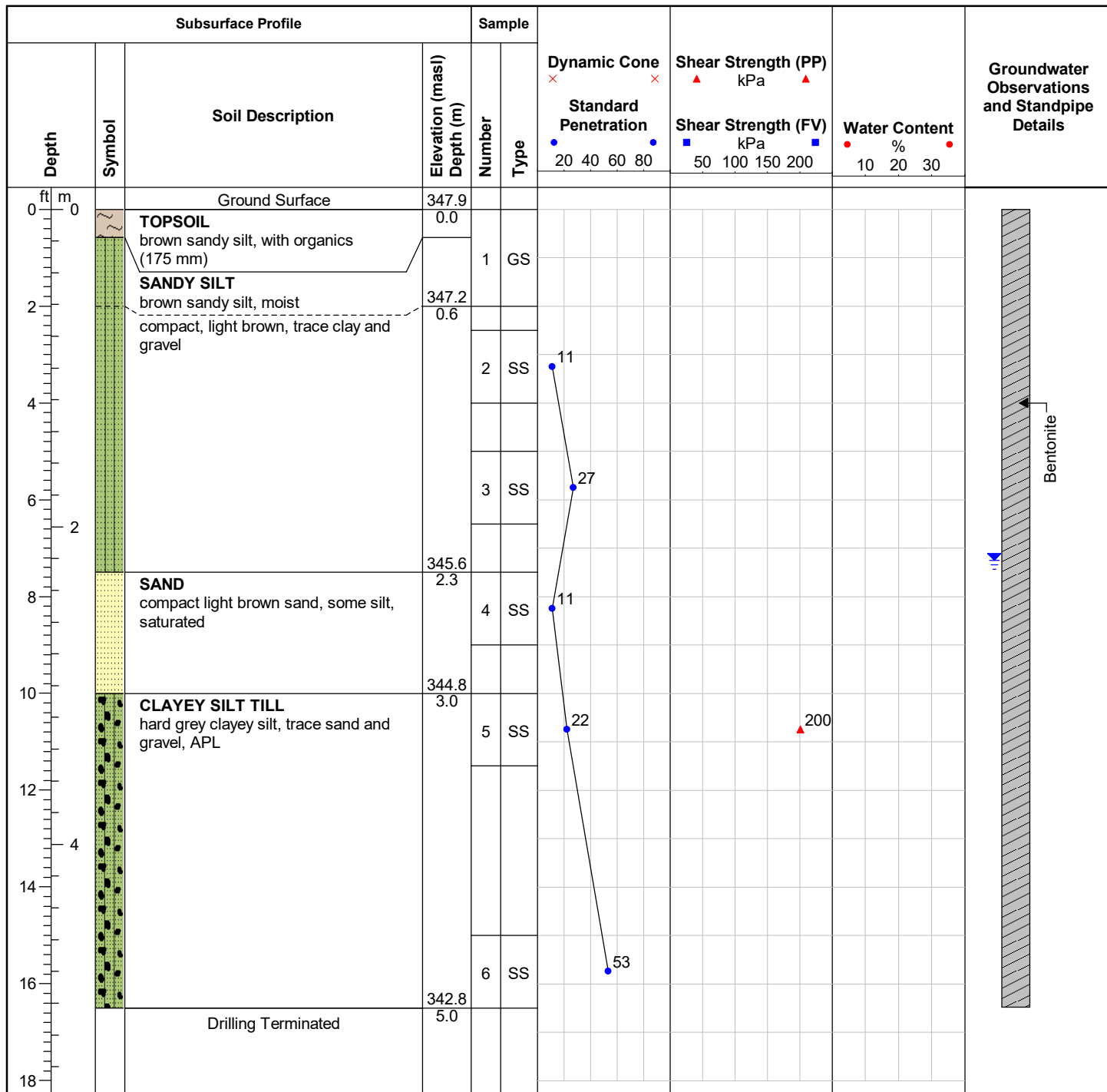
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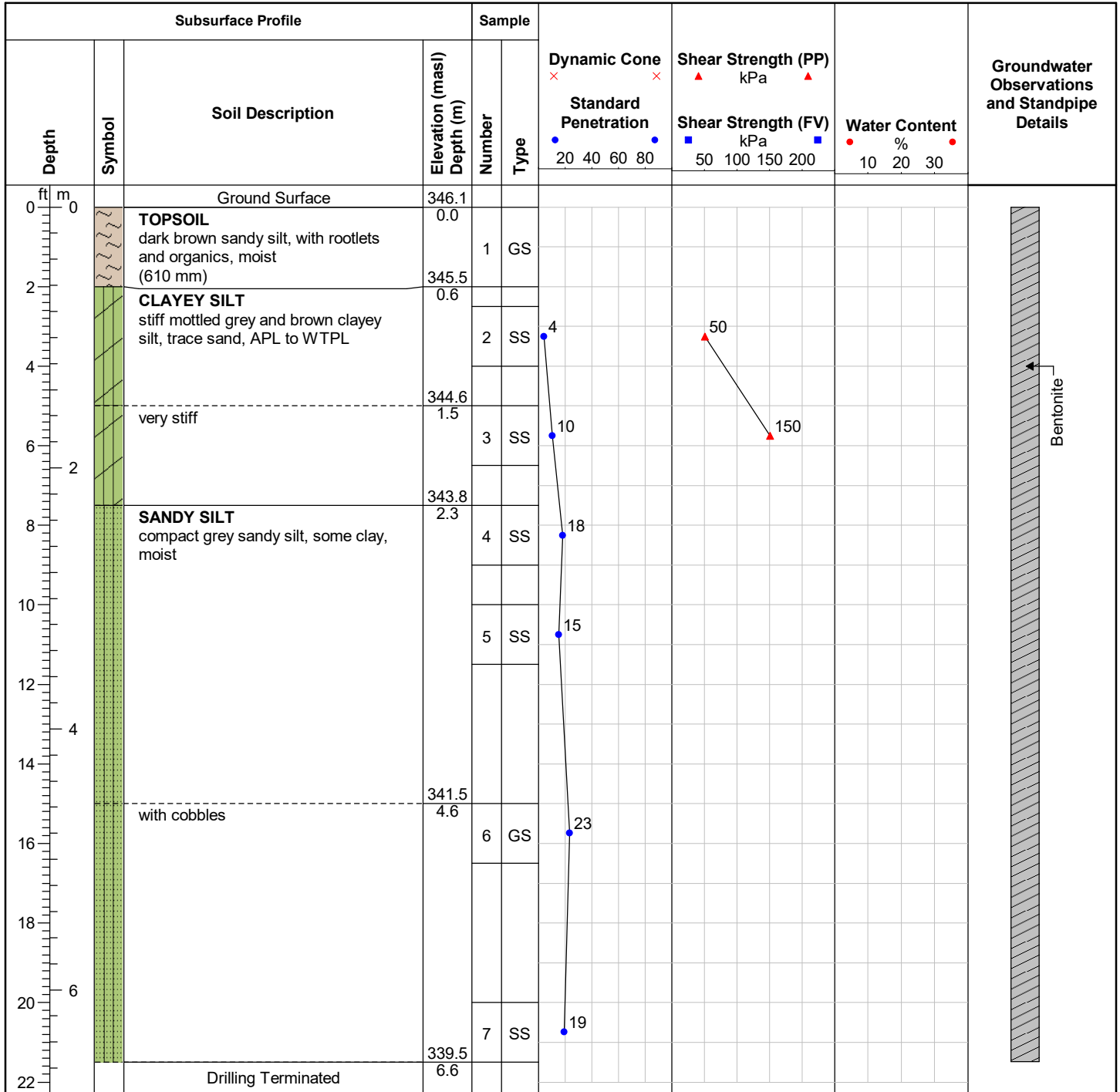
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Date (YYYY-MM-DD)		Rev No.	0	

Appendix B

Borehole Logs

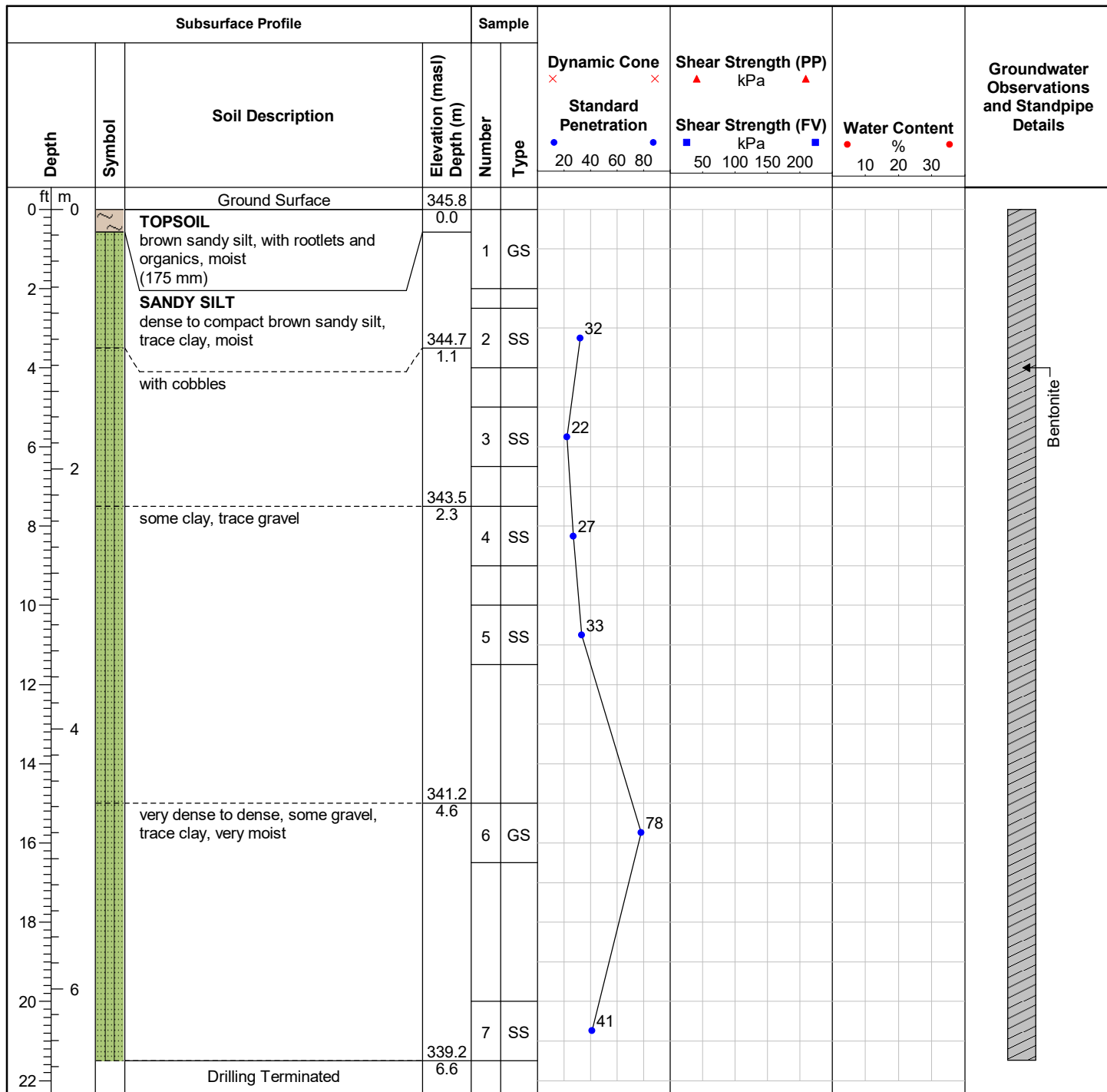
ID No.: BH101-23**Project Name:** St. Jacobs Subdivision**MTE File No.:** 60682_001**Client:** Schlegel Urban Developments**Site Location:** 52 Hawkesville Road, St. Jacobs, Ontario**Date Completed:** 9/11/2023**Drilling Contractor:** London Soil Test Ltd.**Drill Rig:** Diedrich D-50**Drill Method:** Hollow Stem Augers**Protective Cover:** N/A**Field Technician:** C. McCulla**Drafted by:** H. Sandhu**Reviewed by:** K. Rundle Drake

Water encountered at 2.2 mbgs (Elevation 345.7 masl) during drilling

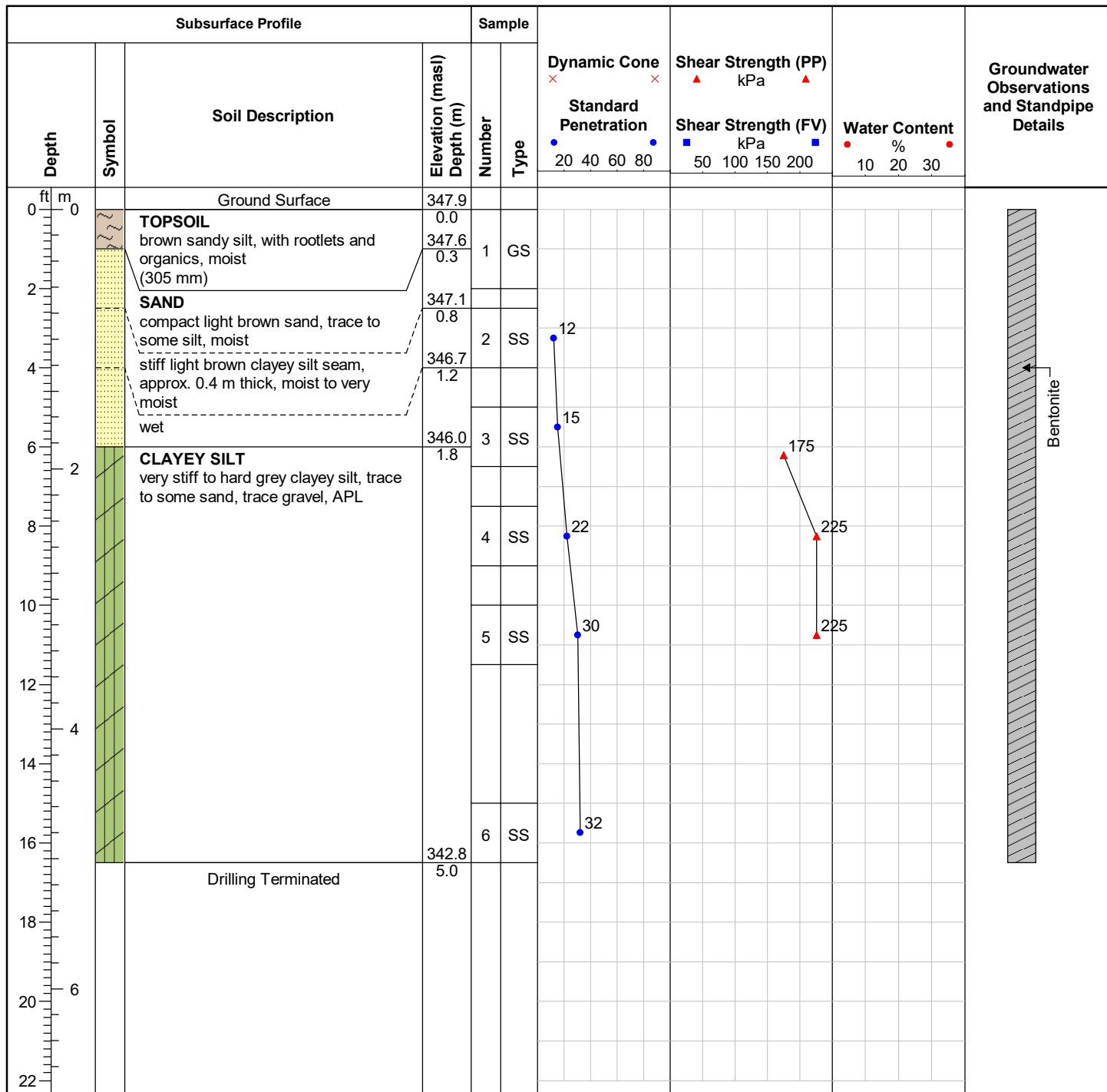
ID No.: BH102-23**Project Name:** St. Jacobs Subdivision**MTE File No.:** 60682_001**Client:** Schlegel Urban Developments**Site Location:** 52 Hawkesville Road, St. Jacobs, Ontario**Date Completed:** 9/11/2023**Drilling Contractor:** London Soil Test Ltd.**Drill Rig:** Diedrich D-50**Drill Method:** Hollow Stem Augers**Protective Cover:** N/A**Field Technician:** C. McCulla**Drafted by:** H. Sandhu**Reviewed by:** K. Rundle Drake

Borehole dry upon completion of drilling

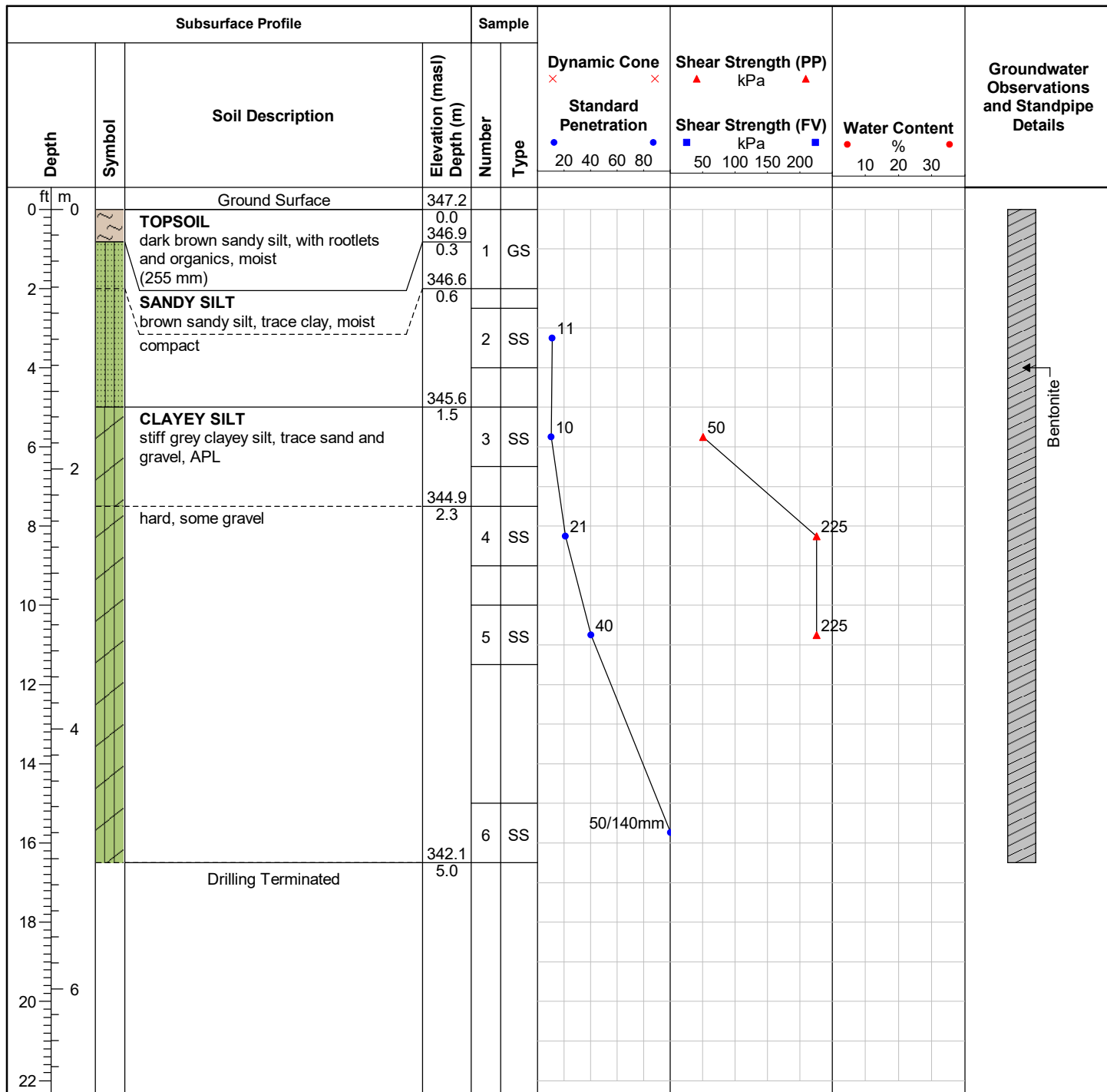
Sheet: 1 of 1

ID No.: BH103-23**Project Name:** St. Jacobs Subdivision**MTE File No.:** 60682_001**Client:** Schlegel Urban Developments**Site Location:** 52 Hawkesville Road, St. Jacobs, Ontario**Date Completed:** 9/11/2023**Drilling Contractor:** London Soil Test Ltd.**Drill Rig:** Diedrich D-50**Drill Method:** Hollow Stem Augers**Protective Cover:** N/A**Field Technician:** C. McCulla**Drafted by:** H. Sandhu**Reviewed by:** K. Rundle Drake

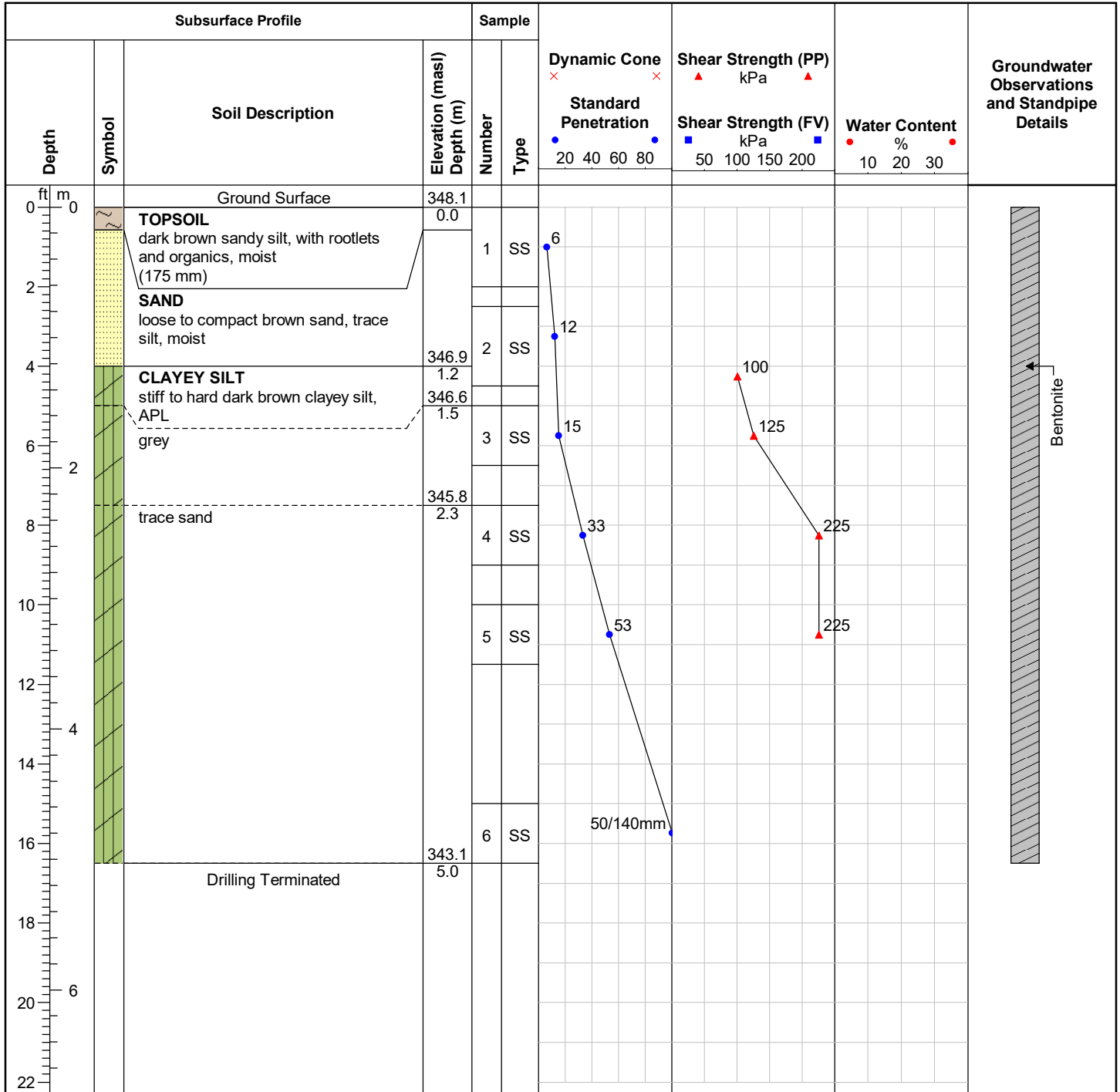
Borehole dry upon completion of drilling

ID No.: BH104-23**Project Name:** St. Jacobs Subdivision**MTE File No.:** 60682_001**Client:** Schlegel Urban Developments**Site Location:** 52 Hawkesville Road, St. Jacobs, Ontario**Date Completed:** 9/11/2023**Drilling Contractor:** London Soil Test Ltd.**Drill Rig:** Diedrich D-50**Drill Method:** Hollow Stem Augers**Protective Cover:** N/A**Field Technician:** C. McCulla**Drafted by:** H. Sandhu**Reviewed by:** K. Rundle Drake

Borehole dry upon completion of drilling

ID No.: BH105-23**Project Name:** St. Jacobs Subdivision**MTE File No.:** 60682_001**Client:** Schlegel Urban Developments**Site Location:** 52 Hawkesville Road, St. Jacobs, Ontario**Date Completed:** 9/11/2023**Drilling Contractor:** London Soil Test Ltd.**Drill Rig:** Diedrich D-50**Drill Method:** Hollow Stem Augers**Protective Cover:** N/A**Field Technician:** C. McCulla**Drafted by:** H. Sandhu**Reviewed by:** K. Rundle Drake

Borehole dry upon completion of drilling

ID No.: BH106-23**Project Name:** St. Jacobs Subdivision**MTE File No.:** 60682_001**Client:** Schlegel Urban Developments**Site Location:** 52 Hawkesville Road, St. Jacobs, Ontario**Date Completed:** 9/11/2023**Drilling Contractor:** London Soil Test Ltd.**Drill Rig:** Diedrich D-50**Drill Method:** Hollow Stem Augers**Protective Cover:** N/A**Field Technician:** C. McCulla**Drafted by:** H. Sandhu**Reviewed by:** K. Rundle Drake

Borehole dry upon completion of drilling