



Geotechnical Investigation Report - 11 Air Care Drive, Smiths Falls, Ontario

June 30, 2026

Prepared for:
Town of Smiths Falls

Cambium Reference: 02605058.000

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1.0 Introduction

Cambium Inc. (Cambium) was retained by Town of Smiths Falls (Client) to complete a geotechnical investigation in support of proposed developments located at 11 Air Care Drive in Smiths Falls, Ontario (Site).

This report presents the methodology and findings of the geotechnical investigation at the Site and addresses constraints, requirements, and recommendations relevant to the proposed developments.

1.1 Reviewed Documents

The following project documents were received and reviewed during the drafting of this report:

[1] Integrated Design Engineering + Architecture – 595 Bryon Ave., Ottawa, Ontario [K1A 4C4]

Site Plan – Project Name: Public Works Operation Centre, Project #: 23556, Drawing #:
A1.02, Date: April 16, 2026.

1.2 Standards and Guidelines

Applicable standards, guidelines and other normative documents utilized in preparing geotechnical engineering recommendations for this report are provided below.

[2] Canadian Foundation Engineering Manual – 5th Edition; Canadian Geotechnical Society; 2023.

[3] Ontario Building Code – Ministry of Municipal Affairs and Housing; 2024.

2.0 Background

2.1 Site Description

The Site location is shown in Figure 1. The Site is bounded to the north by Air Care Drive, to the east by Walker Road, and to the west and south by neighbouring commercial properties. The Site currently contains existing an existing salt storage structure, building, and various storage amenities and infrastructure associated with the public works yard. The Site is generally devoid of vegetation and surfaced by gravel. The immediate investigation area limits appeared to be relatively flat between test pit locations with a very slight decrease in elevation from north to south to southeast, based on observations made during the geotechnical investigation and surveyed ground surface elevations of each test pit.

2.2 Project Description

It is Cambium's understanding that the proposed development will include a new commercial building and a cold storage building on Site. It is Cambium's understanding that the proposed buildings will consist of one storey and will not include a basement level. In addition to the proposed buildings, it is understood that the proposed developments are to include new driving/parking areas, landscaped areas, and site services, as needed. As part of the proposed developments, the existing building on Site is to be demolished. It is noted that investigation and reporting associated with the demolition of the existing building were beyond the scope of this project. It is Cambium's understanding that the proposed developments are currently in the conceptual and early design phases and thus detailed designs or plans are currently unavailable.

The geotechnical investigation was required to confirm the existing subsurface conditions as input into the design and construction of the proposed developments. Analysis from the investigation, recommendations for the proposed developments, and relevant supporting documents are provided in the following sections and/or appended to this report.

3.0 Methodology

3.1 Test Pit Investigation

The geotechnical investigation was conducted at the Site by Cambium on May 22nd, 2026. At the request of the Client, the investigation was completed by advancing test pits. A total of six test pits, designated as test pits TP101-26 through TP106-26 were strategically placed and advanced throughout the Site at locations accessible by the excavator. It is noted that test pit locations were chosen and approved by the Client prior to the field investigation and adjusted in the field, as needed, to accommodate access/locate constraints. Test pits were advanced to depths ranging between approximately 1.0 to 1.8 meters below ground surface (mbgs) and all test pits were terminated after practical refusal was encountered.

Excavating and sampling of the test pits was completed using an excavator provided by the Client and operating under the supervision of a Cambium technician. Soil samples were collected, as needed, whenever a change in soil type occurred, starting directly at or beneath the surface material. The encountered soil units were logged in the field using visual and tactile methods, and samples were placed in labelled plastic bags for transport, future reference, possible laboratory testing, and storage.

Open test pits were checked for groundwater and general stability prior to backfilling. All test pits were backfilled using the removed material and efforts were made to reinstate the property to pre-existing conditions.

Test pit logs are provided in Appendix A. Test pit locations are shown in Figure 2. Soil, groundwater, and bedrock conditions are described, as applicable, with relevant geotechnical recommendations discussed in the following sections of this report.

3.2 Site Survey

The location of each test pit was surveyed using a Sokkia Real Time Kinematic (RTK) surveying unit. Each test pit was referenced to a local, temporary benchmark (the top nut of a fire hydrant located on the east boundary of the Site and Walker Road), shown as benchmark



BM1 on Figure 2. The BM was assigned an elevation of 200. UTM coordinates and relative elevations are included on the test pit logs provided in Appendix A.

3.3 Physical Laboratory Testing

Physical laboratory testing, consisting of two sieve analyses (LS-702), was completed on selected soil samples to confirm textural classification and to assess geotechnical parameters. Moisture content testing was completed on all soil samples. Results from the laboratory testing are presented in Appendix B and are discussed in Section 4.0.

4.0 Subsurface Conditions

The soil stratigraphy encountered in the test pits are indicated on the attached test pit logs in Appendix A. It is noted that the conditions indicated on the test pit logs are for specific locations only and can vary between and beyond the testing locations. The soil boundaries indicated on the test pit logs are inferred from observations during excavating. These boundaries are intended to reflect approximate transition zones and should not be interpreted as exact planes of geological change. In addition, the descriptions provided in the test pit logs are inferred from a variety of factors, including visual observations of the soil samples retrieved, laboratory testing, measurements prior to and after excavating, and the excavating process itself.

The subsurface conditions at the Site generally consisted of granular fill or fill materials at the surface including mixtures of sand and gravel soils. Beneath these materials, fill materials consisting of a silty sand and gravel soil with significant quantities of deleterious fill materials were encountered. In some test pits the deleterious fill materials extended to test pit termination depths while in other test pits a small layer of sand and silt soils inferred to be a native material were encountered prior to termination. All test pits were terminated after practical refusal was encountered on bedrock. Inferred groundwater was encountered within two test pits advanced and standing water was observed within two open test pits upon completion of excavating. The various soil strata are described in detail below and are identified on the test pit logs included in Appendix A.

4.1 Surface Materials

4.1.1 Topsoil

Topsoil was encountered at the surface of test pit TP106-26 with an approximate thickness measured as 100 mm. Topsoil was not encountered with any other test pit advanced.

It is noted that analysis of the organic content within the topsoil materials was beyond the scope of this investigation.

4.1.2 Surficial Fill Materials

At the surface of each test pit excluding test pit TP106-26, gravel and sand, sandy gravel, or gravelly sand soils were encountered that contained variable amounts of silt content.

The gravel and sand soils were encountered in test pits TP101-26 and TP102-26, extending to depths of approximately 0.4 and 0.3 mbgs, respectively. The gravel and sand soils were generally consistent with a granular fill material.

The sandy gravel soils were encountered in test pits TP103-25 and TP105-26 and contained large pieces of fractured rock or gravel. These soils were generally not consistent with a granular fill material. The sandy gravel soils extended to depths of approximately 0.5 and 0.3 mbgs, respectively.

The gravelly sand soils were encountered in test pit TP104-26 and contained rootlets. These soils appeared to be a fill material. Test pit TP104-26 was advanced close to the perimeter of the Site where some organic growth appeared to be present in some locations.

The surficial fill materials were generally brown to grey in colour and moist at the time of the investigation with natural moisture content ranging between 1.8 to 3.5% based on laboratory testing.

Laboratory particle size distribution analysis was completed for two samples of the surficial fill materials taken from the test pits and depths indicated below. The analysis results are summarized in Table 1 with full results provided in Appendix B.

Table 1 Particle Size Distribution Analysis – Surficial Fill Materials

Sample	Depth (mbgs)	Soil	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Moisture (%)
TP101-26, GB1	0.0 – 0.4	Gravel and Sand some Silt	49	41	10		2.8
TP103-26, GB2	0.0 – 0.5	Sandy Gravel trace Silt	79	20	4		1.9

4.2 Deleterious Fill Materials

Beneath the surficial materials, fill materials consisting of a silty sand and gravel soil with significant amounts of deleterious material were encountered at all test pit locations. The deleterious fill materials extended to depths between approximately between 1.0 and 1.8 mbgs and extended to termination depths in test pits TP102-26, TP105-26, and TP106-26. Based on the results of the investigation and observations made during the investigation, it is inferred that these deleterious fill materials were previously placed as part of a grade raise for the Site.

The deleterious fill materials were generally brown to dark brown in colour and moist to wet at the time of the investigation with natural moisture content ranging between 4.1 to 12.3% based on laboratory testing.

4.3 Sand and Silt Soils

A small layer of sand and silt soils with minimal to trace gravel content were encountered underlying the deleterious fill materials in test pits TP101-26, TP103-26, and TP104-26. The sand and silt soils extended to test pit termination depths where encountered. It is inferred that the sand and silt soils are native materials to the Site.

The sand and silt soils were generally grey to brown in colour and moist, about the plastic limit, or greater than the plastic limit at the time of the investigation with natural moisture content ranging between 14.7 to 17.2% based on laboratory testing.

4.4 Bedrock

Practical refusal was encountered within all test pits advanced. Based on the results of the investigation, practical refusal was caused by bedrock.

Below, Table 2 summarizes the depths of practical refusal and associated bedrock elevations at each test pit location.

Table 2 Practical Refusal Depths and Bedrock Elevations

Test Pit	Elevation (mREL)	Depth of Practical Refusal (mbgs)	Inferred Bedrock Elevation (mREL)
TP101-26	200.1	1.8	±198.3
TP102-26	200.1	1.8	±198.3
TP103-26	200.0	1.5	±198.5
TP104-26	199.8	1.5	±198.3
TP105-26	200.0	1.2	±198.8
TP106-26	199.6	1.0	±198.6

Based on the results of the field investigation, the bedrock profile at the Site appears to be relatively flat, with slight increase in surface elevation from approximate north to south.

It should be noted that as test pits were not advanced and subsurface conditions were not exposed throughout the entirety of the Site, there is potential for the presence and/or profile of bedrock at the Site to vary in areas not explored. To confirm the presence and/or depth of bedrock at the Site in areas not explored, further investigation would be required.

4.5 Groundwater

At the time of the investigation, inferred groundwater was encountered within two test pits advanced and standing water was observed within two open test pits upon completion of excavating. The inferred depth to groundwater is taken as the depth at which in-situ soils become wet or saturated while the standing water level depth is measured from open test pits upon completion of drilling.

Below, Table 3 summarizes the groundwater measurements made during the field investigation.

Table 3 Groundwater Measurements During Field Investigation

Test Pit	Elevation (mREL)	Depth of Groundwater (mbgs)	Groundwater Elevation (mREL)	Depth of Standing Water (mbgs)	Standing Water Elevation (mREL)
TP101-26	200.1	1.3	±198.8	1.3	±198.8
TP102-26	200.1	1.5	±198.6	1.5	±198.6
TP103-26	200.0	N/A	N/A	N/A	N/A
TP104-26	199.8	N/A	N/A	N/A	N/A
TP105-26	200.0	N/A	N/A	N/A	N/A
TP106-26	199.6	N/A	N/A	N/A	N/A

Based on the results of the investigation, it is inferred that groundwater may be present at the Site within the depths explored, however, it should be noted that groundwater levels at the Site may fluctuate seasonally and in response to climatic events. Given the season in which the investigation was completed (i.e. late Spring season, some recent rainfall events) it is possible that the groundwater encountered within the test pits may be surface water infiltrated into the subsurface after recent rainfall events and the standing water noted near the bottom of the test pits may be surface water perched atop the native materials or bedrock surface. It is noted that any groundwater measurements made at the Site are based upon observations made during and immediately after the excavating process and should not be interpreted as confirmation, or lack thereof, of the presence of water or stabilized water levels at the Site. Further investigation or a hydrogeological study would be required to confirm or deny the presence of groundwater throughout the Site and in different seasons.

5.0 Geotechnical Design Considerations

This section of the report provides engineering information on, and recommendations for, the geotechnical design aspects of the project based on our interpretation of the test pit information, the laboratory test data, and our understanding of the project requirements. The information in this portion of the report is provided for planning and design purposes for the guidance of the design engineers and architects. Where comments are made on construction, they are provided only to highlight aspects of construction which could affect the design of the project. Contractors bidding on or undertaking any work at the Site should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction and make their own independent interpretation of the factual data as it affects their proposed construction techniques, schedule, equipment capabilities, costs, sequencing, and the like. Cambium will not assume any responsibility for construction-related decisions made by contractors based on this report. It is possible that subsurface conditions beyond the test pit locations may vary from those observed. If significant variations are found before or during construction, Cambium should be contacted to reassess findings and recommendations, as needed.

5.1 Project Understanding

It is Cambium's understanding that the proposed developments consist of two new buildings, parking/driving areas, and new Site services. It is understood that the proposed buildings will not include a basement level. It is Cambium's understanding that the proposed developments are currently in the conceptual and early design phases and thus detailed design information is currently unavailable. As such, Cambium has provided the following recommendations based on the information available at the time of report preparation. It is noted that once detailed design information becomes available or if plans for the developments are altered, Cambium can be contacted to confirm/update the recommendations provided within this report, as needed.

5.2 Site Preparation

Beneath any proposed development footprints, any and all topsoil, materials containing significant organic content, fill material and/or deleterious materials should be excavated and removed. All excavated material should be removed to a minimum distance of 1 m around any proposed development footprint. Any materials with significant quantities of organics and deleterious materials (i.e., construction debris, etc.) are not appropriate for use as fill. Any exposed subgrades should be inspected by qualified personnel prior to placement of any material or construction. Any loose or soft soils identified within the exposed subgrade should be excavated and replaced with suitable fill material as approved by qualified personnel.

5.3 Excavations and Shoring

All excavations must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA) and Ontario Regulation 213/91 (as amended).

Soils above the groundwater table can be considered Type 3 soils and as such, excavation side slopes should be no steeper than 1H:1V. Where excavations are proposed to extend below the groundwater table, adequate advance dewatering will be required to achieve a Type 3 soil classification. If the excavation extends below the groundwater table without adequate dewatering, the soil at the face of the excavation would be classified as Type 4 and a maximum unsupported side slope inclination of 3H:1V would be required for OHSA compliance. Where the side slopes consist of more than one soil type, the soil shall be classified as the type with the highest number among the soil types present. Please note that the soil type classifications indicated above are provisional and are subject to change based on field observations of the actual conditions at the time of exposure. It is recommended that a qualified geotechnical engineer be retained during construction operations to assess the excavations and confirm soil types.

Based on the results of the investigation, excavations beneath the groundwater table may be required. In general, it is recommended that construction operations and excavations be completed during seasonally dry conditions to potentially limit the extent of dewatering and groundwater present during excavations.

Excavation side slopes should be protected from exposure to precipitation and associated ground surface runoff and should be inspected regularly for signs of instability. If localized instability is noted during excavation or if wet conditions are encountered, the side slopes should be flattened as required to maintain safe working conditions or the excavation sidewalls must be fully supported (shored). It is noted that the preferred method of temporary shoring, if required, should be determined at the discretion of the contractor based on Site conditions at the time of construction.

Stockpiles of excavated materials should be kept at least at the same distance as the excavation depth from the top edge of the excavation to prevent slope instability. Care should also be taken to avoid overloading of any existing underground services/structures by stockpiles.

5.4 Dewatering

Based on the results of the investigation, groundwater may be encountered during construction operations, however, this may be dependent on the final depth of excavation, on-Site conditions at the time of construction, and the time of year in which construction operations are completed. Given the somewhat variable nature of the groundwater encountered on Site, consideration may be given to completing additional test pits prior to construction to obtain additional information on groundwater.

If encountered, groundwater, or surficial runoff into the excavations may be controllable with filtered sumps and pumps. If excavations for the proposed developments are to extend significantly past the groundwater table, advance dewatering may be required. If necessary, any dewatering measures should be accordingly provided and designed by the contractor and/or a qualified hydrogeologist, as needed.

It is noted that as the maximum dewatering rate for the construction activities is expected to be less than 50,000 L/day an EASR registration is not expected to be required for the proposed development.

5.5 Frost Penetration

Based on climate data and design charts, the maximum frost penetration depth below the surface at the Site is estimated at 1.6 mbgs. Any footings and utilities should be founded at or below a depth of 1.6 mbgs, upon free-draining fill material extending to below 1.6 mbgs or be adequately insulated. It is noted that intensely fractured bedrock is considered frost susceptible. If encountered within the frost depth, the intensely fractured bedrock should be excavated to sound bedrock. Inspections of any exposed bedrock are recommended to confirm suitability.

5.6 Foundation Design

As previously mentioned, it is Cambium's understanding that the project is currently within the early design and conceptual stages and thus detailed design information was not available at the time of report preparation. As such, based on the results of the investigation and Cambium's understanding of the project, it is inferred that bedrock will be the preferred bearing material and thus the following recommendations have been provided accordingly. It is noted that if detailed design information becomes available or if other materials are considered for bearing, Cambium can be contacted to confirm and/or reassess the recommendations provided, as needed.

5.6.1 Conventional Shallow Footings

From a geotechnical perspective and based on the results of the investigation, the proposed buildings can generally be supported on standard strip and/or spread footings founded on sound bedrock.

Foundations bearing on sound bedrock may be designed using a bearing capacity of 600 kPa at SLS and ULS. Considering bedrock is non-yielding, the geotechnical reaction at SLS should be taken as equal to the geotechnical reaction at ULS. It is noted that a higher bearing capacity for the bedrock may be attainable if inspections are completed on exposed bedrock prior to construction. It is recommended that any exposed bedrock to be used as a bearing material be inspected prior to construction to confirm suitability.

Cambium recommends that foundations not span across multiple subgrade materials due to the potential for differential settlement. If footings are proposed to span across multiple subgrade materials, Cambium should be contacted to review and provide additional recommendations, as needed. Under no circumstances will the foundations be placed directly on organic materials, loose, frozen subgrade, construction debris, or within ponded water. It must be noted that the deleterious fill materials are not a suitable bearing material.

It is noted that as test pits were not advanced and subsurface soils were not exposed throughout the entirety of the building footprints, there is potential for variation in the subsurface materials at the Site. As such, it is strongly recommended that a subgrade inspection be completed following excavation to confirm the suitability and capacity of the exposed materials prior to placement of any engineered fill or construction of footings. It is recommended that a qualified geotechnical engineer be retained to review final site grading plans and foundation dimensions/elevations or to develop further recommendations, as needed.

5.6.2 Floor Slabs

All organic, deleterious, and fill material must be removed prior to constructing floor slabs. It is recommended that the slab be provided with a capillary moisture barrier. This is made by placing the slab on a minimum 200 mm layer of clear stone and nominally compacted by vibration to a dense state. Alternatively, the capillary moisture barrier can be composed of a 200 mm thick layer of OPSS 1010 Granular A, compacted to a minimum 98% of standard Proctor maximum dry density (SPMDD). Under slab drainage is not required beyond the capillary moisture barrier provided the floor slab elevation is set at 300 mm or higher than the exterior grade. The subgrade for the slab should be inspected and approved by Cambium, prior to the placement of an aggregate base.

5.7 Backfill and Compaction

Excavated soils not containing significant organics content, deleterious materials, or significant deposits of silt and/or clay may be appropriate for use as fill below grading areas, provided that

the actual or adjusted moisture content at the time of construction is within a range that permits compaction to required densities. Some moisture content adjustments may be required depending upon seasonal conditions. Geotechnical inspections and testing are required to confirm acceptable quality. Onsite materials containing significant deposits of silt and/or clay may be re-used for landscaping purposes at the discretion of a landscape architect. It is inferred that on site soils will generally not be suitable for fill below grading areas.

Foundation wall backfill should consist of free draining imported granular material as required. If onsite soils are not sufficiently free draining, this should be accomplished using well graded OPSS 1010 Granular B Type I or II material. If a drainage layer membrane is used against the foundation, then OPSS 1010 Granular B material may not be required, but the proposed backfill material should be inspected and approved by a geotechnical engineer prior to placement. Backfill should be placed in lifts not exceeding 200 mm in thickness and compacted to 98% of SPMDD. Backfill adjacent to structural elements should be compacted to 95% of SPMDD taking care not to damage the adjacent structures. Any placement of engineered fill should be verified by onsite compaction testing during construction.

5.8 Subdrainage

Provided that the proposed buildings will not include a basement level and provided that the floor slabs are constructed as per the recommendations in Section 5.6.2, subdrains are not anticipated to be required. Exterior grades for any building developments should be sloped away from the building walls to promote adequate drainage and prevent ponding of water and potential build up of hydrostatic pressures.

5.9 Seismic Site Classification

The Ontario Building Code (OBC) specifies that the structures should be designed to withstand forces due to earthquakes. For the purpose of earthquake design, geotechnical information shall be used to determine the "Site Class". The parameters for determination of Site Classification for Seismic Site Response are set out in Table 4.1.8.4.-B of the OBC (2024). The classification is based on the determination of the average shear wave velocity in the top

30 meters of the site stratigraphy, where shear wave velocity (v_{s30}) measurements have been taken. Alternatively, the classification is estimated on the basis of rational analysis of undrained shear strength (s_u) or penetration resistances (N_{60} values).

Based on the explored soil properties and in accordance with Table 4.1.8.4.-B, it is recommended that Site Class 'B' or Site Designation X_c applied at the Site, provided that the building will be founded on sound bedrock. If bedrock is not to be used as a bearing material, Cambium should be contacted to revise these recommendations, as needed.

It is noted that if a higher Site Class or Site Designation is required, a geophysics investigation can be completed to obtain the required parameters.

5.10 Buried Utilities

Trench excavations should be completed as per the requirements outlined in Sections 5.2 and 5.3.

Bedding and cover material for any services should consist of OPSS 1010 Granular A or B Type II, placed in accordance with pertinent Ontario Provincial Standard Drawings. The bedding and cover material shall be placed in maximum 200 mm thick lifts and should be compacted to at least 98% of SPMDD. The cover material shall be a minimum of 300 mm over the top of the pipe and compacted to 98% of SPMDD, taking care not to damage the utility pipes during compaction. If bedding is being placed in wet conditions consideration should be given to using 19 mm crushed clear stone underlain by a geotextile (Terrafix 270R or similar) installed as per the manufacturer's recommendations.

5.11 Pavement Design

The performance of the pavement is dependent upon proper subgrade preparation. All asphalt/gravel, topsoil, deleterious fill materials, and organic materials within the proposed driving/parking area footprints should be removed and backfilled to the proposed pavement structure elevation, as needed, with approved engineered fill or native material compacted to a minimum 98% of SPMDD. Prior to beginning construction of the pavement structure, the subgrade should be proof rolled and inspected by qualified personnel. Any areas where rutting

or appreciable deflection is noted should be sub-excavated and replaced with suitable fill. The fill should be compacted to at least 98% of SPMDD. The recommended pavement structure should meet the municipal standards for parking and driving areas and should, as a minimum, consist of the pavement layers identified in Table 4.

The light duty pavement structure is intended for car and light-truck parking areas and the heavy-duty pavement structure is appropriate for areas where heavy traffic is anticipated.

Table 4 Recommended Minimum Pavement Structure

Pavement Layer	Light Duty	Heavy Duty
Surface Course Asphalt	40 mm HL3 / HL4	50 mm HL3 / HL4
Binder Course Asphalt	50 mm HL8	60 mm HL8
Granular Base	150 mm OPSS 1010 Granular A	150 mm OPSS 1010 Granular A
Granular Subbase	300 mm OPSS 1010 Granular B	450 mm OPSS 1010 Granular B

It is Cambium's understanding that some portions of the driving/parking areas are intended to remain gravel surfaced. In these locations, it is recommended that the Heavy Duty pavement structure be utilized with the Granular Base thickness being increased from 150 mm to 200 mm. If further recommendations are required related to the gravel parking/driving areas, Cambium can be contacted, as needed.

Material and thickness substitutions must be approved by the Design Engineer. If desirable, Superpave 12.5 HMA may replace HL3/HL4, and Superpave 19.0 HMA may replace HL8, both conforming to OPSS.MUNI 1150 and with a minimum traffic level / category of B. The thickness of the subbase layer could be increased or decreased at the discretion of the Design Engineer, to accommodate site conditions at the time of construction, including soft or weak subgrade soil replacement or a bedrock subgrade. Compaction of the subgrade should be verified by qualified personnel prior to placing the granular fill. Granular layers should be placed in maximum 150 mm thick lifts and compacted to at least 98% of SPMDD. The granular materials specified should conform to OPSS standards, as confirmed by appropriate materials testing. The final asphalt surface should be sloped at a minimum of 2% to shed runoff. Abutting pavements should be sawcut to provide clean vertical joints with new pavement areas and

consideration may be given to utilizing lap joints where new pavements intersect with existing roadways, driveways, or entrances.

5.12 Design Review and Inspections

Testing and inspections should be carried out during construction operations to test and approve construction materials and placement and to examine and approve subgrade conditions. We should be contacted to review and approve final design drawings, prior to tendering or commencing construction, to ensure that all pertinent geotechnical-related factors have been addressed.

5.13 Changes in Site and Project Scope

Subsurface conditions can be altered by the passage of sufficient time, natural occurrences, and human intervention. This geotechnical engineering report is intended for planning and design purposes only. It is reiterated that the recommendations provided in this report are developed based on the information available at the time of report preparation. If further design information becomes available, Cambium can be contacted to reassess the recommendations provided in this report and determine the need for additional investigation, if required.



6.0 Closing

Please note that this work program and report are governed by the attached Qualifications and Limitations. If you have questions or comments regarding this document, please do not hesitate to contact the undersigned at (613) 389-2323.

Respectfully submitted,

Cambium Inc.

Farhan Imtiaz, P.Eng.
Project Manager

Stuart Baird, M.Eng., P.Eng.
Director of Technical Operations, Services

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7.0 Statement of Qualifications & Limitations

Limited Warranty

Cambium relies on its client to provide instructions on the scope of work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards, and with the degree of care and skill ordinarily exercised by professionals performing similar services for similar projects in the same region. Unless required under applicable laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

Reliance on Materials and Information

The findings, results, information and data prepared by Cambium are based on the materials, documents and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work. In formulating its findings, results, information and data, Cambium assumes that the information, documents and materials provided by the client to Cambium are factual, accurate and represent a true depiction of the circumstances that exist at the Project. Cambium relies on its client to inform Cambium if there are changes to any such information, documents and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information, documents or materials provided by the client, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to Cambium, are unknown by Cambium, or are otherwise concealed from Cambium during the provision of its services.

Facts, conditions, information and circumstances may vary with time and locations and Cambium's work is based on a review of such matters as they existed at the particular time and location indicated in the findings, results, information and data prepared by Cambium. No assurance is made by Cambium that the facts, conditions, information, circumstances or any underlying assumptions made by Cambium in connection with the work performed will not change after Cambium has completed its work. If any such changes occur or additional information is obtained, Cambium should be advised and requested to consider if the changes or additional information affect its work.

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Site Assessments

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Figures

GEOTECHNICAL INVESTIGATION

TOWN OF SMITHS FALLS

11 Air Care Drive
Smiths Falls, Ontario

LEGEND

-  Highway
-  Major Road
-  Minor Road
-  Railway
-  Watercourse
-  Water Area
-  Wooded Area
-  Built Up Area

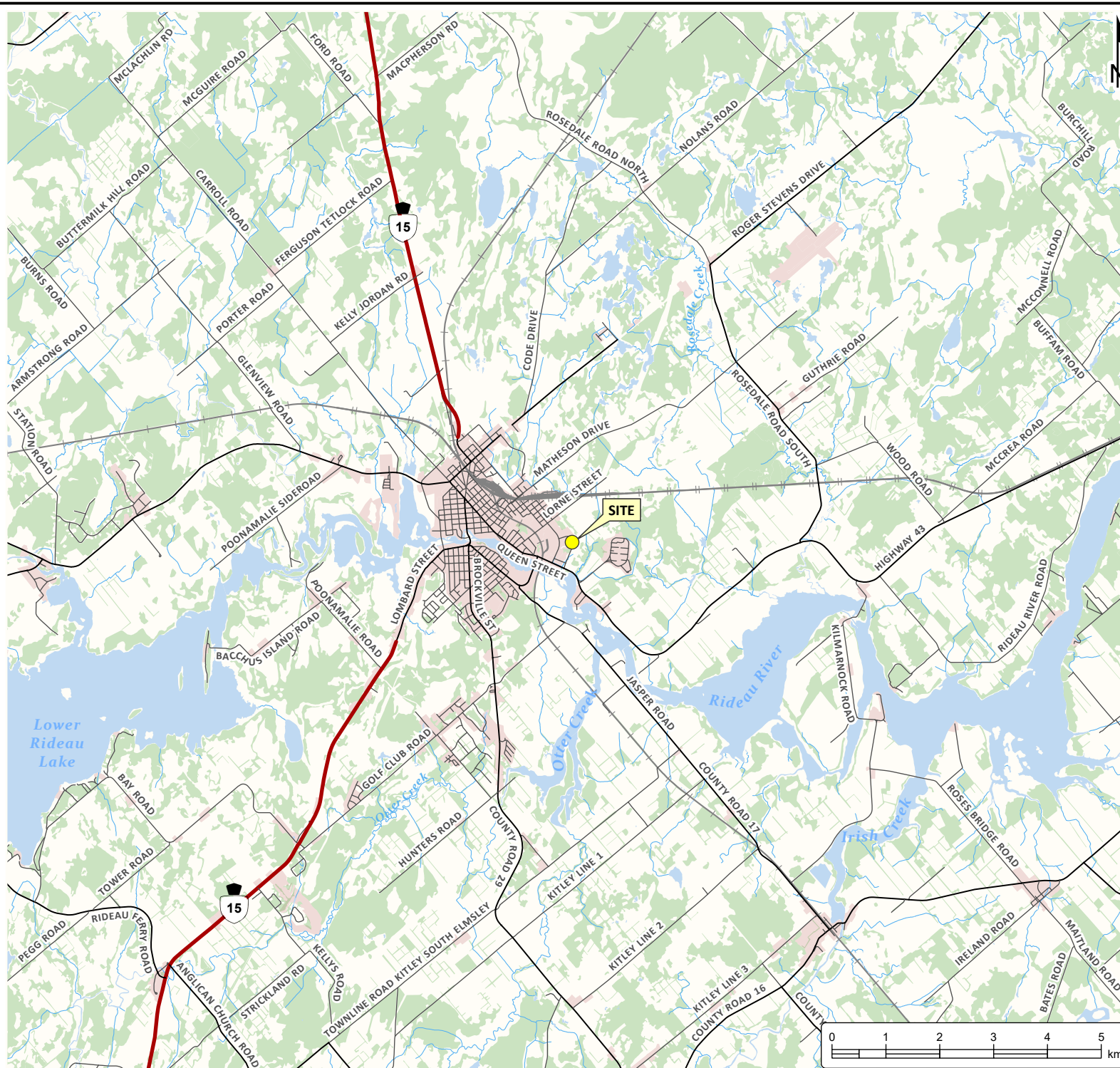
Notes:
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 - Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
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www.cambium-inc.com

SITE LOCATION PLAN

Project No.: 02605058.000	Date: June 2026
Scale: 1:100,000	Projection: NAD 1983 UTM Zone 18N
Created by: DS	Checked by: FI
Figure: 1	





**GEOTECHNICAL
INVESTIGATION**
TOWN OF SMITHS FALLS
11 Air Care Drive
Smiths Falls, Ontario

LEGEND

-  Benchmark
 Test Pit
 Site (approximate)

Notes:
- Benchmark is a fire hydrant.
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TEST PIT LOCATION PLAN

Project No.: 02605058.000	Date: June 2026
Scale: 1:1,500	Projection: NAD 1983 UTM Zone 18N
Created by: DS	Checked by: FI
Figure: 2	



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Appendix A

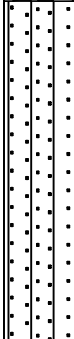
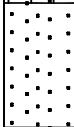
Test Pit Logs



Client: Town of Smiths Falls
Contractor: N/A
Project No.: 02605058.000
Location: 11 Air Care Drive, Smith Falls, ON

Project Name: 11 Air Care DR
Method: Test Pit
Elevation: 200.13 mREL
UTM: 18T **N:** 4872023.00 **E:** 421284.00

Log of Borehole: TP101-26
Page: 1 of 1
Date Completed: May 22, 2026

SUBSURFACE PROFILE				SAMPLE																
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)			Shear Strength Cu, kPa				Well Installation	Log Notes			
									LL	PL	PI	25	50	75	20			40	60	80
									% Moisture			SPT (N)								
									25	50	75	20	40	60	80					
200.1	0		(GW) GRAVEL and SAND: some silt; grey; moist [GRANULAR FILL]	199.72	1	GB			2.8%								Test pit terminated on bedrock. Test pit caving measured at 0.5 mbgs. Groundwater encountered at 1.3 mbgs. Standing water measured at 1.3 mbgs.			
199.6	0.5		(SM) SILTY SAND and GRAVEL: with deleterious materials (asphalt, wood); dark brown; moist [FILL]	0.41																
199.1	1		becomes wet	198.68	2	GB			7.5%											
198.6	1.5		(SP) SAND and SILT: grey to brown; w>PL	1.45	3	GB			18.7%											
198.1	2		Borehole terminated @ 1.8 mbgs due to excavator refusal.	1.83																
197.6	2.5																			
197.1	3																			
196.6	3.5																			
196.1	4																			
GRAINSIZE DISTRIBUTION																				
SAMPLE GRAVEL SAND SILT CLAY																				
GB1 49 41 10																				

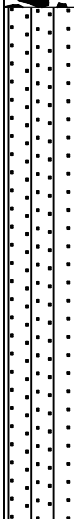
Test pit terminated on bedrock. Test pit caving measured at 0.5 mbgs. Groundwater encountered at 1.3 mbgs. Standing water measured at 1.3 mbgs.



Client: Town of Smiths Falls
Contractor:
Project No.: 02605058.000
Location: 11 Air Care Drive, Smith Falls, ON

Project Name: 11 Air Care DR
Method: Test Pit
Elevation: 200.12 mREL
UTM: 18T **N:** 4971995.00 **E:** 421288.00

Log of Borehole: TP102-26
Page: 1 of 1
Date Completed: May 22, 2026

SUBSURFACE PROFILE				SAMPLE															
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)			Shear Strength Cu, kPa				Well Installation	Log Notes		
									LL	PL	PI	nat V _c	rem V _c	+					
									25	50	75	20	40	60	80				
									% Moisture			SPT (N)							
									25	50	75	20	40	60	80				
200.1	0		(GW) GRAVEL and SAND: some silt; brown; moist [GRANULAR FILL]	199.87	1	GB			2.8%								Test pit terminated on bedrock. Test pit caving measured at 0.7 mbgs. Groundwater encountered at 1.5 mbgs. Standing water measured at 1.5 mbgs		
			(SM) SILTY SAND and GRAVEL: with deleterious materials (asphalt, wood, plastic); brown; moist [FILL]	0.25															
199.6	0.5																		
199.1	1				2	GB			8.7%										
198.6	1.5		becomes wet	198.29															
198.1	2		Borehole terminated @ 1.8 mbgs due to excavator refusal.	1.83															
197.6	2.5																		
197.1	3																		
196.6	3.5																		
196.1	4																		
GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY																			

Logged By: SM

Input By: JG

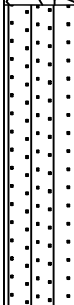
Peterborough, Barrie, Whitby, Kingston, Ottawa



Client: Town of Smiths Falls
Contractor:
Project No.: 02605058.000
Location: 11 Air Care Drive, Smith Falls, ON

Project Name: 11 Air Care DR
Method: Test Pit
Elevation: 200.00 mREL
UTM: 18T **N:** 4971977.00 **E:** 421319.00

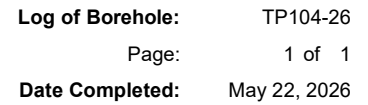
Log of Borehole: TP103-26
Page: 1 of 1
Date Completed: May 22, 2026

SUBSURFACE PROFILE					SAMPLE														
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)			Shear Strength Cu, kPa				Well Installation	Log Notes		
									LL	PL	PI	nat V _r	rem V _r	θ					
									25	50	75	20	40	60	80				
									% Moisture			SPT (N)							
									25	50	75	20	40	60	80				
200	0		(GP) sandy GRAVEL: trace silt; brown; moist [FILL]		1	GB			1.9%								Large fractured rock/gravel encountered within sandy gravel soils.		
199.5	0.5		(SM) SILTY SAND and GRAVEL: with deleterious material; brown; moist [FILL]	199.52 0.48															
199	1				2	GB			4.1%										
198.5	1.5		(SP) SAND and SILT: grey to brown; moist	198.58 1.42 198.48 1.52	3	GB			14.7%								Tet pit terminated on bedrock. Test pit caving not observed. Groundwater not encountered. Standing water not observed.		
			Borehole terminated @ 1.5 mbgs due to excavator refusal.																
198	2																		
197.5	2.5																		
197	3																		
196.5	3.5																		
196	4																		
GRAINSIZE DISTRIBUTION																			
SAMPLE GRAVEL SAND SILT CLAY																			
GB1 76 20 4																			

Logged By: SM

Input By: JG

Peterborough, Barrie, Whitby, Kingston, Ottawa



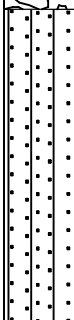
Peterborough, Barrie, Whitby, Kingston, Ottawa



Client: Town of Smiths Falls
Contractor:
Project No.: 02605058.000
Location: 11 Air Care Drive, Smith Falls, ON

Project Name: 11 Air Care DR
Method: Test Pit
Elevation: 200.03 mREL
UTM: 18T **N:** 4971939.00 **E:** 421309.00

Log of Borehole: TP105-26
Page: 1 of 1
Date Completed: May 22, 2026

SUBSURFACE PROFILE				SAMPLE													
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)			Shear Strength Cu, kPa				Well Installation	Log Notes
									LL	PL	PI	nat V.	rem V.	σ _v			
									25	50	75	20	40	60	80		
									% Moisture			SPT (N)					
									25	50	75	20	40	60	80		
200	0		(GP) sandy GRAVEL: trace silt; brown; moist [FILL]	199.78	1	GB			1.8%								
199.5	0.5		(SM) SILTY SAND and GRAVEL: with deleterious materials (brick); dark brown; moist [FILL]	0.25	2	GB			12.3%								
199	1			198.81													
198.5	1.5		Borehole terminated @ 1.2 mbgs due to excavator refusal.	1.22													
198	2																
197.5	2.5																
197	3																
196.5	3.5																
196	4																

GRAINSIZE DISTRIBUTION

SAMPLEGRAVEL SAND SILT CLAY

Large fractured rock/gravel encountered within sandy gravel soils.

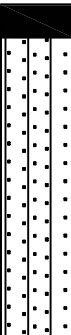
Test pit terminated on bedrock. Test pit caving not observed. Groundwater not encountered. Standing water not observed.



Client: Town of Smiths Falls
Contractor:
Project No.: 02605058.000
Location: 11 Air Care Drive, Smith Falls, ON

Project Name: 11 Air Care DR
Method: Test Pit
Elevation: 199.57 mREL
UTM: 18T **N:** 4971910.00 **E:** 421317.00

Log of Borehole: TP106-26
Page: 1 of 1
Date Completed: May 22, 2026

SUBSURFACE PROFILE					SAMPLE													
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)			Shear Strength Cu, kPa				Well Installation	Log Notes	
									LL	PL	PI	nat V _{rem V}	20	40	60			80
199.6	0		TOPSOIL: 100mm	199.47														
			(SM) SILTY SAND and GRAVEL: with deleterious materials, organics, rootlets; dark brown; moist [FILL]	0.10														
199.1	0.5				1	GB				11.5%								
198.6	1		Borehole terminated @ 1 mbgs due to excavator refusal.	198.55														
				1.02														
198.1	1.5																	
197.6	2																	
197.1	2.5																	
196.6	3																	
196.1	3.5																	
195.6	4																	
GRAINSIZE DISTRIBUTION																		
SAMPLE GRAVEL SAND SILT CLAY																		

Test pit terminated on bedrock. Test pit caving not observed. Groundwater not encountered. Standing water not observed.



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Appendix B

Laboratory Results

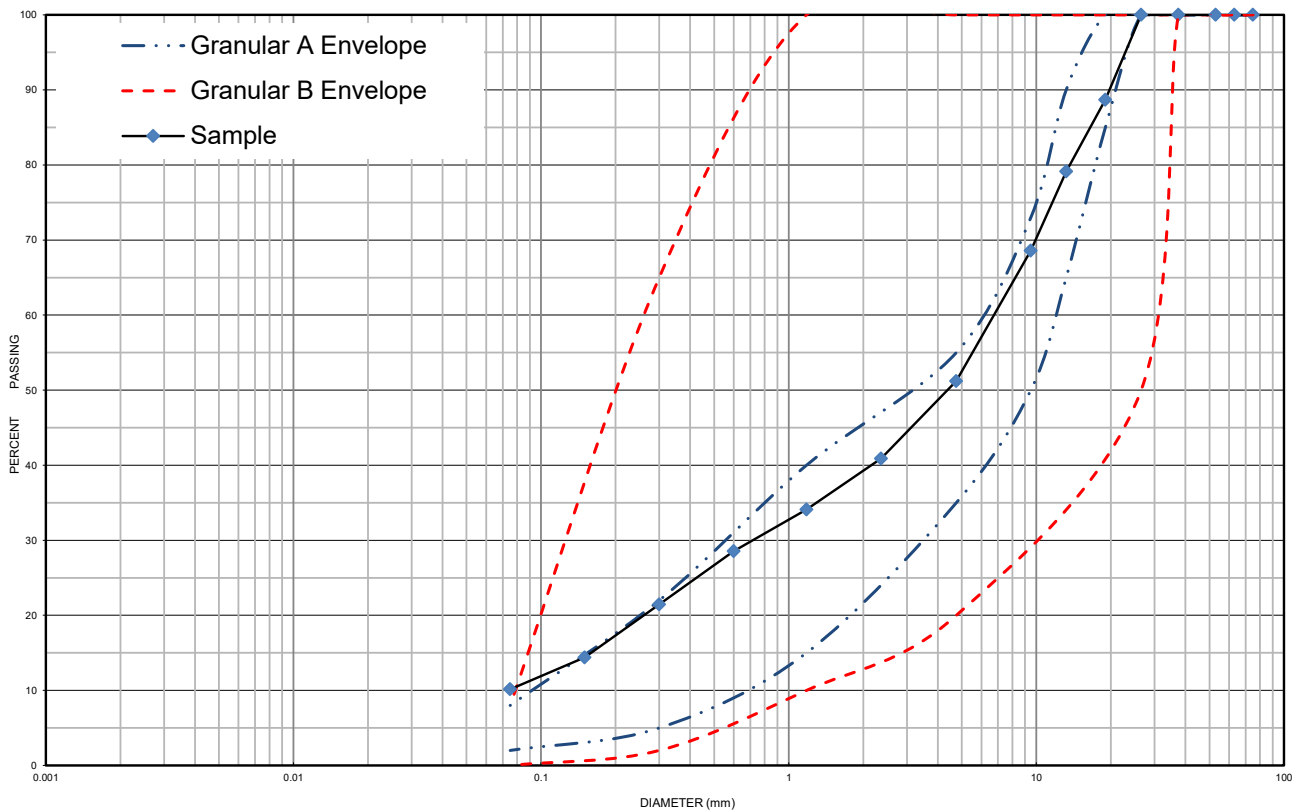


Grain Size Distribution Chart

Project Number: 02605058-000
Project Name: 11 Air Care Drive
Sample Date: May 22, 2026
Location: TP 101-26 GB 1

Client: Town of Smith Falls
Sampled By: Samuel Makinde - Cambium Inc.
Depth: 0 m to 0.4 m
Lab Sample No: S-6-0598

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 101-26	GB 1	0 m to 0.4 m	49	41	10		2.8
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Gravel and Sand some Silt		SP	6.700	0.700	-	-	-

Additional information available upon request

Issued By:  (Senior Project Manager) **Date Issued:** June 2, 2026

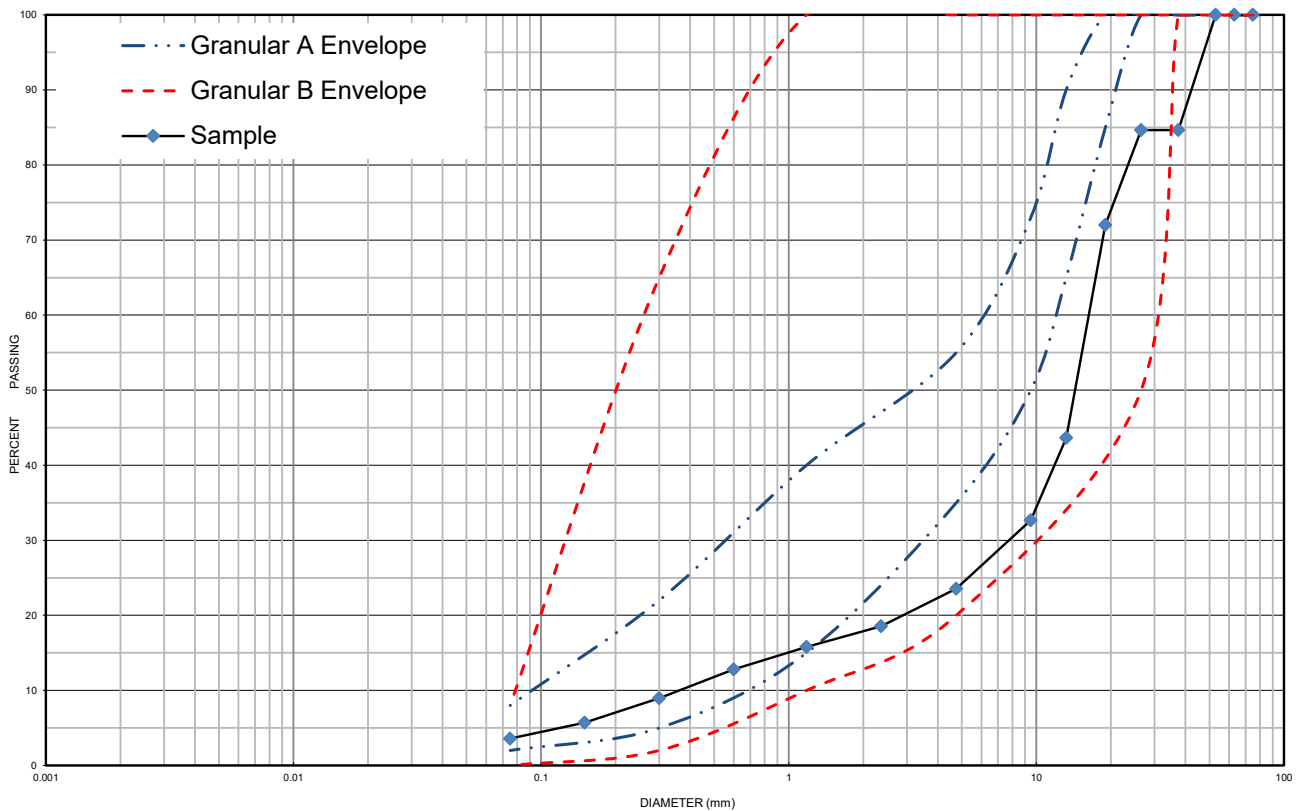


Grain Size Distribution Chart

Project Number: 02605058-000
Project Name: 11 Air Care Drive
Sample Date: May 22, 2026
Location: TP 103-26 GB 1

Client: Town of Smith Falls
Sampled By: Samuel Makinde - Cambium Inc.
Depth: 0 m to 0.5 m
Lab Sample No: S-26-0599

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 103-26	GB 1	0 m to 0.5 m	76	20	4		1.9
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Sandy Gravel trace Silt		GP	10.650	7.900	0.360	29.58	16.28

Additional information available upon request

Issued By: 
(Senior Project Manager)

Date Issued: June 2, 2026



Moisture Content



Project Number: 026050580.000
Project Name: 11 Air Care Drive
Client: Town of Smith Falls
Date Taken: 2026-05-22

Lab Number: S-26-0597
Date Tested: 2026-05-28
Tested By: A. Heffernan

Borehole Number	Sample Number	Sample Depth (m)	Water Weight (g)	Water Content (%)	Additional Observations
101	1	0.00-0.41	36.9	2.8	NR
101	2	0.41-1.45	17.9	7.5	
101	3	1.45-1.83	35.8	18.7	
102	1	0.00-0.25	5.6	2.8	
102	2	0.20-1.83	19.2	8.7	
103	1	0.00-0.48	25.2	1.9	NR
103	2	0.48-1.42	8.3	4.1	
103	3	1.42-1.52	27.6	14.7	
104	1	0.00-0.46	7.9	3.5	
104	2	0.46-1.37	14.4	5.2	
104	3	1.37-1.52	29.7	17.2	
105	1	0.00-0.20	6.4	1.8	
105	2	0.20-1.22	17.4	12.3	
106	1	0.10-1.01	16.6	11.5	

- | | |
|------------------------------------|--|
| 1 – Contains organics | 6 – Very moist – near optimum moisture content |
| 2 – Contains rubble | 7 – Moist – below optimum moisture |
| 3 – Hydrocarbon Odour | 8 – Dry – dry texture – powdery |
| 4 – Unknown Chemical Odour | 9 – Very small – caution may not be representative |
| 5 – Saturated – free water visible | 10 – Hold sample for gradation analysis |