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April 14, 2026

Anthem Properties Group  
Suite 1100 Bentall IV Box 49200  
Vancouver, BC V7X 1K8

Attn: Sheima Rezai  
Senior Manager, Development

**Re: D07-12-26-0021  
Desktop Geotechnical Review and Pavement Recommendations –  
Proposed Parking Lot Reconstruction, 2085 Carling Avenue, Ottawa,  
Ontario  
Cambium Reference: 02601125.000**

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## INTRODUCTION

Cambium Inc. (Cambium) is pleased to provide Anthem Properties Group (Client) with the following letter report in support of the north parking lot reconstruction at the above noted location (the Site). This report provides preliminary geotechnical recommendations based on a desktop review of available subsurface information of the Site.

The Site is the north parking lot located at Carlingwood Mall (2085 Carling Avenue), Ottawa, Ontario. The parking area is located north of the main mall building, and bounded by Saville Road, Haymarket Street and Iroquois Road to the west, north and east, respectively. The Site is currently developed with an existing 2-storey concrete parking structure.

This report is based only on a desktop review of publicly available information and information provided by the Client. Reference should be made to the Limitations and Use of Report, as well as the attached Qualifications and Limitations of this report, which follows the text but forms an integral part of this document.



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**BACKGROUND**

It is Cambium’s understanding that the proposed development includes the demolition of the existing 2-storey parking structure, to be reconstructed as an at-grade asphalt paved parking lot.

Cambium was requested to complete a review of available background information and provide recommendations based on the anticipated soil conditions at the Site. This report provides preliminary comments on excavation, site grading, construction, and preliminary pavement design based on the findings of the desktop review.

No test holes (e.g., boreholes, test pits) were advanced at the Site by Cambium to confirm soil conditions. The recommendations provided in this report should therefore be considered preliminary and may require updating based on actual site conditions.

**DESKTOP REVIEW**

Publicly available data reviewed during the desktop study include Ontario well records, Ontario Geological Survey (OGS) maps and historical aerial photography of the Site.

The following drawings were provided to Cambium by the Client for review:

- Preliminary Parking Layout Concept – Fotenn Planning+Design; dated January 15, 2026, and
- Lot Servicing, Grading and Drainage Plan – Anthem Minett Carlingwood Holdings, Project No.: CC0-26-3216, Drawing No.: C101; dated January 30, 2026.

Ontario well records retrieved during the review include about twenty records in the area of the Site with termination depths ranging between approximately 6 to 50 metres below ground surface (mbgs).

Historical aerial photography from geoOttawa was also reviewed to determine the approximate age of the existing parking structure and review historical conditions. Based on this review, it is understood that the existing parking



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structure was constructed c. 1980. Furthermore, it appears that the Site was used predominantly as at-grade parking prior to construction of the existing parking structure.

**PROJECT UNDERSTANDING**

Based on review of the aforementioned drawings, the existing ground surface appears to slope down to the north across the subject site, dropping approximately 0.5 to 1.0 m from south to north. The grade change from the bottom level of the parking structure to the ground surface along Haymarket Street results in a retaining wall with a maximum height of approximately 1.5 m along the north edge of the existing parking lot.

Based on the provided grading plan, it is understood that grade raises of up to approximately 1.8 m are proposed for the parking lot construction, in order to bring the ground surface to approximately at grade with Haymarket Street and provide overland drainage routes. Some grade lowering (cut) areas appear to be proposed for levelling in the south portion of the Site, but the proposed regrading will primarily require notable fill placement.

**SUBSURFACE CONDITIONS**

**Soils**

The Site soils are anticipated to consist of granular fill material placed for construction of the existing pavement/concrete structure. The condition of the granular fill material is not known, but may be reusable upon testing and inspection during construction. The fill material likely extends to frost penetration depth around supporting columns and foundation elements (at least 1.8 mbgs). The depth of the fill material may be less between columns.

Native soils would be expected underlying the granular fill materials. Based on a review of OGS mapping, the subject site lies within a Drumlinized Till Plains physiographic region. The native soils are therefore anticipated to consist predominantly of stone-poor, sandy silt to silty sand till on Paleozoic terrain. Glacial till is a heterogeneous mixture of all grain sizes; due to the nature of till



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deposition, soil composition can vary across the Site, perhaps significantly, ranging from non-cohesive to plastic in nature. While not necessarily expected based on physiographic and surficial geology mapping, cobbles and boulders should generally be anticipated within till deposits.

**Bedrock**

Bedrock is not anticipated to be encountered during construction, as bedrock depths according to nearby records range between 1.2 and 4.8 mbgs; excavations are not expected to reach these depths. The local bedrock is mapped as limestone and/or shale of the Gull River Formation.

**Groundwater**

Well records in proximity to the Site (i.e., within approximately 250 m) were reviewed. The static groundwater level (where noted) ranged between approximately 3 and 11 mbgs. These represent momentary observations only; the groundwater level may vary, at times significantly, in response to precipitation, snowmelt, seasonal variations and climatic conditions.

**PRELIMINARY CONSTRUCTION RECOMMENDATIONS**

The following recommendations are provided for guidance only. They have been developed based on a desktop review of local geological conditions, and are not based on a direct soil sampling investigation. If conditions are encountered during construction which do not match those assumed herein, Cambium should be contacted for guidance to reevaluate and update these recommendations as needed.

**Temporary Excavation and Support**

All excavations must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA). The existing Site soils are anticipated to consist of fill material overlying sandy silt to silty sand glacial till. These soils may be classified as Type 3 soils above the groundwater table, and Type 4 soils below the groundwater table, in accordance with OHSA.



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Type 3 and Type 4 soils may be excavated with side slopes no steeper than 1H:1V and 3H:1V, respectively. Any unsupported excavation slopes should be regularly monitored for signs of movement during construction and flattened or stabilized as required. If excavations cannot be shaped to accommodate safe slopes, the excavations should be appropriately shored.

Excavation slopes should be protected from exposure to precipitation and associated ground surface runoff. Care should be taken keep material stockpiles and heavy equipment away from the top of excavations by a distance equal to the depth of excavation, or greater.

### Temporary Groundwater Control

Significant groundwater inflows are not anticipated to be encountered during construction, provided that construction is planned outside of periods of seasonal high precipitation and groundwater levels (e.g., spring). If groundwater is encountered, it is expected that flow volumes should be low and controllable using filtered sumps and pumps. Excavations should be graded to drain towards temporary sump pits as required.

### Site Grading

Based on the provided drawings and discussion with the Client, it is understood that the existing concrete parking structure will be demolished, with the intent to construct a new at-grade parking lot. The existing surface grades slope down from south to north; proposed grading indicates that the ground surface is to be brought to approximately at grade with Haymarket Street. Grade raises of up to approximately 1.8 m are therefore anticipated.

The anticipated native soils (glacial till deposits) at the subject site would be expected to be generally non-cohesive, and therefore not susceptible to long-term consolidation. Furthermore, based on review of historical photography, it is anticipated that original construction of the existing parking structure resulted in a cut to construct the lower parking structure level, thereby unloading the native soils. Any raising of grades to previous/historical ground surface elevations would



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therefore not be anticipated to induce settlements, as underlying soils would have already experienced similar loading in the past.

### Subgrade Preparation

The performance of any pavement is dependent upon a properly prepared and well-drained subgrade. All topsoil, existing asphalt concrete, organic materials, wet/loose/frozen or otherwise deleterious materials, are to be removed from the subgrade prior to fill placement. The subgrade should be inspected by Cambium personnel, and a proof roll should be conducted using a fully-loaded triaxle haul truck. Any soft or yielding areas should be sub-excavated and replaced with suitable fill conforming to OPSS Select Subgrade Material (SSM) standards. For areas within 1 m of proposed finished grade, fill should consist of material conforming to OPSS Granular A or Granular B Type I or II specifications. The fill should be placed in maximum 200 mm thick loose lifts and compacted to at least 98% of the material's Standard Proctor Maximum Dry Density (SPMDD).

Subgrade surfaces should be provided with a minimum 2% slope. Compaction and preparation of the subgrade should be verified by the Engineer prior to placing the any fill material.

The importance of a properly prepared and well-drained subgrade to long-term pavement performance cannot be overstated. In this regard, consideration should be given to providing subdrains throughout the proposed parking lot. These should consist of 150 mm diameter perforated, corrugated plastic pipe, wrapped in a suitable filter fabric and surrounded on all sides by 150 mm of 19 mm clear crushed stone. The clear stone trenches should be lined with non-woven geotextile to prevent clogging. The subdrains pipe inverts should be set at minimum 300 mm below subgrade elevation. All subdrains should be provided with positive outlets, such as a connection to catch basins or storm sewers.

The most severe loading conditions on pavement subgrades will occur during construction, and subgrades may become disturbed due to construction operations. Additionally, the provided pavement structure should be considered preliminary, as it is based on assumptions of the subsurface conditions. The



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recommended pavement structure provided may not be adequate due to the presence of localized disturbed areas and it may be necessary to increase the thickness of the pavement granular subbase and/or incorporate geosynthetics (e.g., non-woven geotextile separator and/or geogrid) between the subgrade surface and the granular material. The requirement for an increase in thickness to the pavement structure and/or incorporating geosynthetics will be evaluated by Cambium personnel during proof roll inspections.

**Pavement Structure**

It is assumed that the parking lot will be used predominantly by passenger vehicles with occasional service vehicles (e.g., snowplows, waste management trucks, delivery trucks, etc.). The following material thickness recommendations are provided based on anticipated loading conditions and anticipated subgrade conditions; a heavy-duty pavement structure is recommended where heavy vehicles are expected (e.g., trucks and emergency vehicles), while a light-duty pavement structure may be used where only passenger vehicles are expected (e.g., parking stalls). It is recommended that the provided pavement structure be reviewed following confirmation of the subgrade soils. Table 1 below presents the recommended minimum pavement structures.

**Table 1 Recommended Minimum Pavement Structure**

| Pavement Layer         | Heavy Duty          | Light Duty           |
|------------------------|---------------------|----------------------|
| Surface Course Asphalt | 40 mm HL3 or SP12.5 | 50 mm HL3 or SP 12.5 |
| Binder Course Asphalt  | 50 mm HL8 or SP19.0 | --                   |
| Granular Base          | 150 mm Granular A   | 150 mm Granular A    |
| Granular Subbase       | 400 mm Granular B   | 300 mm Granular B    |

Material and thickness substitutions must be approved by the Design Engineer. The thickness of the subbase layer could be increased at the discretion of the Engineer, to accommodate site conditions at the time of construction, including soft or weak subgrade soils.



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**Material Specifications**

Fill material used for backfilling of subexcavated subgrade areas should be placed in maximum 200 mm thick loose lifts and compacted to at least 98% of the material's SPMDD.

Where geotextiles are required as a material separator between dissimilar materials to prevent long-term migration of fine particles, non-woven geotextile should be used. The geotextile should conform to Class II non-woven specifications per OPSS.MUNI 1860. In this regard, the geotextile should consist of Terrafix 360R, or an approved equivalent. Where additional reinforcement to fill materials is required, Terrafix TBX11 or an approved equivalent should be used. All geotextiles and geogrids should be provided with a minimum 300 mm overlap between adjacent sheets and installed according to the manufacturer's instructions.

Fill materials placed within 1 m of proposed finished grades, including pavement granular materials, should be placed in maximum 200 mm thick loose lifts and compacted to minimum 100% of the materials' SPMDD.

All granular materials specified should conform to OPSS 1010 standards, as confirmed by appropriate materials testing.

**Design Review and Inspections**

Cambium must be contacted to review the subsurface conditions during construction to confirm the provided pavement design and validity of recommendations provided herein. It is vital that onsite geotechnical supervision be provided at the Site during excavation and backfill procedures in order to approve the subgrade. Additionally, testing will be required for compaction during placement of the granular material. Cambium can provide a separate cost proposal for the inspection and testing services.

**LIMITATIONS AND USE OF REPORT**

This geotechnical engineering report is preliminary in nature and intended for preliminary planning and design purposes only. It should be noted that the



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discussion and recommendations that have been presented are based on the desktop review of publicly available background information and not from direct subsurface investigations; therefore, the subsurface information provided herein should be considered assumptions only. If more accurate or precise information about the site subsurface conditions is desired or required based on a change in the proposed work, including but not limited to construction of new footings or foundation elements, a geotechnical investigation involving test holes must be completed.

**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) 696-6221.

Best regards,

**Cambium Inc.**  
 DocuSigned by:

  
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Samuel Makinde, PMP  
 Geotechnical Engineering –Technologist

Signed by:  
  
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Nathan Christie, P.Eng.  
 Senior Geotechnical Engineer

DS



2026-04-14

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## CAMBIUM QUALIFICATIONS AND LIMITATIONS

### Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local 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.

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The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, 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 or that are concealed from Cambium during the provision of services, work or reports.

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### Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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Potential liability to the client arising out of the report is limited to the amount of Cambium's professional liability insurance coverage. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for consequential damages.

### Personal Liability

The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.

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