



Environmental

Geotechnical

Building Sciences

Construction Quality
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March 10, 2023

Triple T Holdings Inc.
P.O. Box 1079
Peterborough, Ontario K9J 7A9

Attn: Bill Turner

**Re: Lakefield South Residential Development, Part of Lots 26 & 27
Concession 7 (former Smith Ward), Lakefield, Ontario
Response to Stantec Recommendations and Comments re:
Cambium's Geotechnical Reports for the Site
Cambium Reference: 5874-001**

Dear Mr. Turner,

The purpose of this letter is to provide Cambium's response to recommendations and considerations provided by Stantec in their Geotechnical Peer Review letter dated June 22, 2021, and addressed to the County of Peterborough. The following are Cambium's responses to the Stantec Recommendations and this letter should be read in conjunction with the above-noted Stantec Peer Review letter. Where noted below that Cambium will provide additional comments, recommendations, clarifications, or confirmations, those will be written up in a geotechnical addendum letter-report.

Stantec Comment (Recommendation 1): *Given the size of the subject property and the presence of shallow bedrock, it is recommended that consideration be given to a supplementary investigation to support final design. Additional investigation along the road/service alignments and at locations where 'larger buildings' are intended or buildings that may potentially include basements would be of value in confirming if bedrock will be encountered at the time of construction.*

- Once the final design is complete Cambium will work with Triple T Holdings to determine where there is a potential need for more geotechnical investigations to provide additional data for detailed design work and where we have sufficient information and subgrade inspections during construction will be sufficient.



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Stantec Comment (Recommendation 2): *The Guideline for Professional Engineers Providing Geotechnical Services (published by PEO) recommends that field testing be conducted using standards such as those in the Canadian Foundation Engineering Manual (CFEM) or ASTM. The reviewer is not familiar with the specific field test used in the test pits. It is acknowledged that Cambium may have specific familiarity with the test method in the context of the conditions encountered on the subject property. However, it is recommended that a limited number of boreholes be advanced at locations coincident with the test pits and that Standard Penetration Tests (SPTs) be conducted in accordance with ASTM 1586. The results of the SPTs can be correlated with the dynamic probe penetration tests such that a more formal interpretation of the test results obtained to date (and hence the compactness or consistency of the soils) can be provided based on the industry standard SPT's.*

- Cambium will make sure that any future geotechnical investigation work will include SPT testing in areas where there are larger structures.

Stantec Comment (For Consideration): *For light loads typically associated with single-family 'residences' the confirmation of depth to bedrock and type of bedrock is often considered satisfactory. If deep excavations are required (for services or basements/underground levels) or if higher loads are anticipated for larger structures, investigation and confirmation of the underlying bedrock is recommended. If a supplementary borehole investigation is advanced on the subject property consistent with the preceding comment, coring of the bedrock can be conducted and the geological characterization (including strength) of the bedrock can be determined.*

- Cambium will make sure that any future geotechnical investigation work will include rock coring in any areas where deeper excavations are required, or higher loads are anticipated for larger structures.



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Stantec Comment (Recommendation 3): *The competent (un-weathered) bedrock was also encountered at depths shallower than 1.8 m in some cases. At this early stage of project development, it is reasonable to anticipate that the scope of development may be revised prior to or at the time of final design. In this respect, based on the final locations of the proposed infrastructure, it is reasonable to presume excavations may penetrate the un-weathered bedrock. Comment regarding this condition would be benefit.*

- Cambium will provide comments and recommendations for excavations into unweathered bedrock in a geotechnical report addendum.

Stantec Comment (Recommendation 4): *Comment regarding excavation in the un-weathered bedrock should be provided for reference.*

- Cambium will provide comments and recommendations for excavations into unweathered bedrock.

Stantec Comment (Recommendation 5): *Comment and recommendations regarding the stability of excavations in the bedrock (both un-weathered and weathered) should be provided.*

- Cambium will provide comments and recommendations regarding the stability of excavations into both un-weathered and weathered bedrock.

Stantec Comment (For Consideration): *For purposes of clarity, the authors may wish to confirm if this line is intended to indicate that all excavated bedrock is unsuitable for reuse as engineered fill (with or without processing) due to the presence of the large pieces of rock or if the excavated bedrock is suitable for reuse (with or without processing) provided that the large pieces are removed.*

- Cambium will provide comments and recommendations of regarding the potential reuse of bedrock as engineered fill (with or without processing).

Stantec Comment (For Consideration): *Can the authors confirm if there are limitations on the size of the footings placed on the native soils.*

- Cambium will provide details on any limitations on the size of the footings placed on the native soils in a geotechnical report addendum.



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Stantec Comment (Recommendation 6): In the absence of a recommendation to the contrary, it is inferred that placement of foundations at this depth on the bedrock will not compromise the required frost protection and/or require manufactured insulation to provide the equivalent frost protection to full depth soil cover. A clarification statement in this respect would be of benefit.

- Cambium will clarify whether foundations on bedrock will require frost protection.

Stantec Comment (Recommendation 7): *The Seismic Site Classification should be provided for use in the structural design of the planned buildings and infrastructure.*

- Cambium will provide a statement regarding the Seismic Site Classification for the Site.

Stantec Comment (Recommendation 8): *Given the presence of the shallow bedrock, it is recommended that guidance and recommendations be provided for the placement of floor slabs in cases where the subgrade consists of the bedrock.*

- Cambium will provide recommendations for the placement of floor slabs in cases where the subgrade consists of bedrock.

Stantec Comment (Recommendation 9): *Clarification should be provided to confirm if the recommendations for the design of the floor slabs on soil sub-grade are also applicable to any commercial units included on the ground floor in the apartment/condo buildings. The modulus of sub-grade reaction should be provided for use in the structural design of the floor slabs (on the native soils and on the bedrock).*

- Cambium will provide recommendations for the modulus of sub-grade reaction for the structural design of floor slabs for commercial units on the ground floor of any apartment/condo buildings.



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Stantec Comment (For Consideration): *The term “rutting” is relatively commonplace in the industry and typically easily observable in the field. Clarification regarding the magnitude of “appreciable deflection” would be of benefit.*

- Cambium will clarify the magnitude of “appreciable deflection” during a proof-roll.

Stantec Comment (Recommendation 10): *It is recommended that the report reference the USD Drawings in the City of Peterborough’s Engineering Design Standards document. The USD drawings include a requirement for perforated subdrains beneath the curb line. Do the authors recommend any additional drainage infrastructure beyond that shown on the USD drawings?*

- The site is not located in the City of Peterborough. Cambium will provide a recommendation that the pavement designs meet or exceed the Township of Selwyn’s engineering design standards for roads.

Stantec Comment (For Consideration): *If the geometric standards are available for the planned roads, it may also be of benefit to confirm that the recommended pavement designs meet or exceed the designs provided in Table C.1 in the City of Peterborough Engineering Design Standard.*

- The site is not located in the City of Peterborough. Cambium will provide a recommendation that the pavement designs meet or exceed the Township of Selwyn’s engineering design standards for roads.

Stantec Comment (Recommendation 11): *Given the variable depth of the bedrock, it is inferred that there may be locations where the services are placed in the native overburden; recommendations should be provided for this case. Clarification should be provided to confirm that the guidance and recommendations provided are also applicable to rigid pipe in bedrock and in the overburden soils.*



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- Cambium will add recommendations for the installation of rigid pipe in bedrock and overburden soils.

Stantec Comment (Recommendation 12): *Given the variability in the depth to bedrock, it may be of benefit to conduct a supplementary investigation when the locations and limits of the building and road infrastructure are finalized. Providing additional information with respect to the bedrock elevation would be of benefit in minimizing or avoiding contract disputes and given the description provided in the report, it is anticipated that excavation into the un-weathered rock may be difficult (and presumably expensive).*

- Cambium will work with Triple T Holdings to determine where on the site it would be useful to further delineate bedrock depths.

Stantec Comment (Recommendation 13): *The scope of development described is quite general, presumably reflecting the early stage in the development process. In this respect, there is no reference to whether basements are intended in any of the proposed buildings. If basements are proposed, investigation to a deeper depth may be warranted, and information regarding lateral earth pressures on basement walls, drainage, and backfill should be provided.*

- Cambium will make sure that any future geotechnical investigation work will extend boreholes to deeper depths where necessary. Cambium will provide information regarding lateral earth pressures in a geotechnical report addendum and any future geotechnical reports.

Stantec comment (Recommendation 14): *The report indicates that storm water management (SWM) infrastructure is intended as a component of the overall development, but this component was not included in the scope of work for the investigation and report. It is inferred that this component will be addressed at a later date via a supplementary investigation which should address: the specific subsurface conditions at the locations of the SWM infrastructure, assessment of hydraulic conductivity/permeability of the overburden and bedrock, design of SWM Pond liner(s) if required/intended, design of containment berms, stability of*



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permanent cut/excavated slopes and constructed earth berms, access roads, and inflow/out-flow infrastructure.

- Cambium agrees that a supplementary geotechnical investigation will likely be required once the location and proposed design is available.

We trust this letter-report is sufficient for your current needs, please contact us if you have any questions.

Best regards,

Cambium Inc.

Stuart Baird, M.Eng., P.Eng.

Director – Geotechnical, Construction
Testing, Building Science

SEB/seb

