



Ottawa, February 15, 2023
No.: 1000-Tawadina-YME-L2

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Bayview Wateridge Inc.

Reference: Proposed development with building footprint spanning across the existing 2.4 m diameter, 40 m depth concrete sewer line at 1000 and 1050 Tawadina Rd.

Subject: Opinion regarding influence of the referenced development on the referenced sewer line and impacts from blasting and hoe rammimg during construction from the geotechnical perspective.

The following assumptions are made to issue this opinion.

- the depth of the proposed USF is assumed roughly at 32 m above the crown of the referenced sewer pipe;
- the trench is assumed to have roughly vertical walls through a soil profile that consists of bedrock from the bottom of the trench to the proposed USF. Its width is assumed to be roughly 5 m;
- The structural problem is solved. The foundation system is assumed to consist on spread and/or strip footings bearing on bedrock at a distance from the edge of the trench that is equal or greater than the width of the footing. The span of the trench is assumed to be bridged via overhead beams and/or grade beams. The effect of any grade beam is assumed to be that of deflections inherent to the material and not the result of a reliance to a soil bearing capacity;
- There will be one to three levels of underground parking. once excavation for construction is completed the fill in the trench at the USF elevation is deemed to have been subjected to a surcharge of 80 kPa from the soils removed.

Geotechnical engineers rely upon Boussinesq stress contours and similar constructs to estimate stress increase under strip and spread footings.

On the basis of those contours, and deflections alone, a 2 m wide rectangular grade beam (as an overhead beam that is only supported at its ends) an estimate of the stress increase can be made. The depth from the grade beam to the top of the pipe is roughly 16 times the width of the beam.

Under the conditions above Bossinesq stress contours indicate that the stress increase induced by the beam is negligible. *This means that under the present surcharge, the sewer pipe is deemed to have been subjected to a load that is greater than that registered by a 2 m wide grade beam at the assumed USF.* That is, a grade beam that can be assumed to rely entirely for support at its end on bedrock and register a stress increase by normal deflections.

With respect to ramming and blasting induced vibrations, due to stiffness increasing downward, it is reasonable to assume that discipation of energy from those operations is largely upward and sideways. Thus, vibration restriction limits for neighboring building can be considered safe for the sewer.

Within the framework of the assumptions made, the building does not represent a detrimental effect on the sewer pipe.

Do not hesitate to contact us if you have any questions.



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