patersongroup **memorandum**

consulting engineers

re: **Geotechnical Review - Sanitary Sewer and USF Conflict**
Proposed Commerical Development - Crown Pointe - Phase 3
Trim Road and Watters Road - Ottawa

to: Taggart Realty Management - **Mr. Kyle Kazda** - kyle.kazda@taggart.ca
date: December 9, 2021
file: PG4655-MEMO.03

Further to your request and authorization, Paterson Group (Paterson) prepared the current memorandum to provide geotechnical recommendations for the existing sanitary sewer located in close proximity to the proposed underside of footing of the proposed McDonald's building within the proposed development to be located at the aforementioned site. The following memo should be read in conjunction with the geotechnical investigation report PG4655-1 dated October 17, 2018.

Paterson reviewed relevant information provided in the following documents in preparation of the current memorandum:

- ❏ General Plan of Services - Sheet Number C-001 - Project No. 163063 Issue 2, prepared by IBI Group dated November 28, 2021.
- ❏ Topo Model - No Plan Number - No Drawing Reference - Provided by Taggart Realty Management dated October 28, 2021.

Background

Based on our review of the above noted drawings and information provided by the client, it is understood that there is a existing 750 mm diameter sanitary sewer, invert level 78.27 m, located approximately 6.5 m from the northeast edge of the proposed McDonald's restaurant building. The sanitary line runs parallel to the building for the entire extend of the building's northeast foundation wall. The underside of footing level for the building was not available at the time of this review, however, based on a finished floor elevation of 88.15 m, the proposed underside of footing level was conservatively assumed to be 86.65 m. Therefore, there is a vertical separation of approximately 8.4 m between the invert of the sanitary sewer and the underside of footing for the proposed building.

The proposed footings and storm sewer are expected to be founded upon a silty clay deposit. Settlement sensitive structures founded upon a native, undisturbed silty clay deposit typically have a footing lateral support zone of 1.5H:1V, refer to the above noted geotechnical report for additional information regarding the lateral support zone of footings.

Geotechnical Review and Recommendations

Based on our review of the above noted documents and information provided by the client, due to the depth of the sanitary pipe with respect to the anticipated proposed underside of footing and the horizontal distance between the pipe and the footing, the loads exerted by the weight of the footings will not impact the existing sanitary pipe. Although the pipe is located within a 1.5H:1V zone of the underside of footing, the depth of influence for the footing from a geotechnical perspective will not extend beyond a maximum of 4 m depth below the footings within the lateral support zone. Therefore, the pipe will be located below the depth of influence of the footing.

However, if maintenance is required for the existing sanitary pipe, open excavation will not be recommended beyond 3 m below the USF level of the proposed footings. A maximum of 3 m of open excavation can be completed followed by a vertical cut into the overburden in conjunction with using a trench box down to the sanitary sewer.

Alternatively, the proposed footings can be placed over zero-entry vertical trenches backfilled with lean concrete extended to a level of 82.3 m. Doing so will transfer the load of the footings and the zone of influence below the sanitary sewer and associated excavation area. The same bearing capacities and post-construction settlement values for silty clay presented in the above noted geotechnical report are applicable to footings founded upon lightweight concrete filled trenches founded upon an undisturbed, silty clay bearing surface approved by Paterson personnel.

Zero-entry vertical trenches can be excavated to an elevation of 82.3 m along the entire extent of the northeast building wall, and backfilled with lean concrete up to the founding elevation of the proposed footings (minimum 17 Mpa 28-day compressive strength). Typically, the excavation side walls will be used as the form to support the concrete. The trench excavation should be at least 150 mm wider than all sides of the strip footing at the base of the excavation. The additional width of the concrete poured against an undisturbed trench sidewall will suffice in providing a direct transfer of the footing load to the underlying silty clay. Once the trench excavation is approved by the geotechnical engineer, lean concrete can be poured up to the proposed founding elevation.

It should be noted that the latter option of lean concrete filled trenches, although acceptable, is not considered practical from a geotechnical perspective due to the depth of the required vertical filled trench. Therefore, Paterson recommends that a trench box be used in the future if maintenance is required for the existing sanitary pipe.

We trust that this memorandum meets your immediate requirements.

Best Regards,

Paterson Group Inc.

Nicole Patey, B.Eng.

Faisal I. Abou-Seido, P.Eng.