



July 18, 2024

Dilworth Development Inc.
92 Bentley Avenue
Ottawa, Ontario
K3E 6T9

Attention: **Mr. Dennis Collautti**

Subject: **Proposed Commercial Development 1.0 m Grade Raise**
2095 Dilworth Road, Kars, ON
Englobe Reference: 02101208.001

Englobe Corp. (Englobe) was retained by Dilworth Development Inc. (Client) to complete a preliminary geotechnical investigation for a proposed commercial development (Project) located at municipal address 2095 Dilworth Road in Kars, Ontario (Site). This memo should be read in conjunction with the original geotechnical investigation report entitled, "Preliminary Geotechnical Investigation Report, Proposed Commercial Development, 2095 Dilworth Road" (Ref No 202101208.000, dated May 1, 2024), prepared By Englobe.

The Site is located in a low-lying area in a former meander of the Rideau River. The soils beneath the Site have discontinuous and irregular deposits of firm to stiff clayey soils. Based on these conditions, within the Preliminary Geotechnical Investigation, Englobe had recommended grade raises of up to 0.5 m to avoid consolidation of the underlying clays and a corresponding long-term settlement. Furthermore, Englobe had presented three foundation options, which included removal of the underlying clays, or deep foundations. Since issuance of the Preliminary Geotechnical Investigation, Englobe has been requested to assess the possibility of increasing the permissible grade raise to 1.0 m to accommodate the civil grading design. The purpose of this memo is to present the potential localized settlement at the Site in relation to a global site grade raise of 1.0 m.

No consolidation testing was performed as part of the Preliminary Geotechnical Investigation to enable specific settlement analysis of the clayey deposits. However, Englobe has performed a desktop review of nearby consolidation testing parameters in an attempt to quantify the possible settlement. **Based on our review, approximately 40 mm of settlement could be expected across the Site from the grade raise alone where clay deposits exists. Any future foundation loads will increase this settlement in the vicinity of the structures.** It is important to emphasize that the clayey deposits are discontinuous, and not enough geotechnical data across the Site has been performed to delineate locations of deep clays (more susceptible to settlement) and no clays (less susceptible to settlement).

The following three foundations options were presented in our original Preliminary Geotechnical Investigation:

- **Option 1:** Sub-excavate the FILL and upper native silts, clays, and sand down to competent native till and replace with new Engineered Fill;
- **Option 2:** Sub-excavate down to competent native till and have deeper footings founded on till and longer foundation walls; or
- **Option 3:** Use deep foundations such as driven piles/caissons or micro piles driven to bedrock refusal.

If one of these three options are considered, then the settlement of structures is not a concern as they will not be founded on clayey soils. However, any future underground utilities and hard surface features, such as retaining walls or hard landscaping, will continue to be subject to settlement and will need to be designed with flexibility and tolerance to increased settlement.

If designers wish to consider a 1.0 m grade raise, and any future shallow foundations with footings founded on the clays, then additional investigation and consolidation testing is recommended at the specific building locations. The 40 mm settlement estimated above, as a result of the grade raise alone, is greater than the typical tolerable settlement of a lightly loaded slab on grade structure. Any new structures to be constructed after the grade raise has been placed would require their own localized Geotechnical Investigation.

We trust this report meets your present requirements. Should you have any questions, please do not hesitate to contact our office.

Yours very truly,

Englobe Corp.

A handwritten signature in black ink, appearing to read 'Shanti R.', with a stylized flourish at the end.

Shanti Ratmono, M.Eng., P.Eng.
Geotechnical Engineer

A handwritten signature in black ink, appearing to read 'Shane D.', with a stylized flourish at the end.

Shane Dunstan, P.Eng.
Geotechnical and Materials - East