TBT ENGINEERING
CONSULTING GROUP

April 18, 2026 TBTE Ref No: 26-0120

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

Attn: Mr. Dennis Colautti
and Mr. Walter Griesseier

Subject: City File Number: D02-02-24-0029
Update to Geotechnical Investigation
Concept Plan (April 2026)
2095 Dilworth Road
Ottawa, Ontario

Introduction

TBT Engineering Limited (TBTE) was retained by Dilworth Development Inc. (Client) to prepare an update the existing Geotechnical Investigation for the new development lot (Project) located at 2095 Dilworth Road (Site) in Ottawa, Ontario.

On January 26, 2026 Novatech (Planner) received formal review comments from the City of Ottawa regarding the Zoning By-law Amendment application for this Site. The comments relating to TBTE's scope pertained to the existing Environmental Site Assessment, Terrain Analysis, and Geotechnical Investigations performed by Englobe Corp. in 2021 through 2025. Since the issuance of these reports, the potential concept plan has advanced from an original commercial subdivision with a retail fuel outlet, to the current potential concept plan which consists of two small lightly-loaded commercial buildings near the south property line. A copy of the current potential concept plan prepared by the Planner is attached at the end of this letter for reference.

This letter is intended to update the existing Preliminary Geotechnical Investigation Report (Ref No: 02101208.000, dated January 06, 2024) prepared by Englobe Corp. for the current design concept, as well as to provide responses to the formal review comments provided by Mr. Derek Kyluk, of the City of Ottawa (City). As agreed with the City in our March 5, 2026 meeting. TBTE has not performed any additional geotechnical fieldwork. This letter is based on the fieldwork performed by Englobe Corp. in 2021 and documented in the 2024 Preliminary Geotechnical Investigation Report.

Current Potential Concept Plan

This letter is intended to support the current Zoning By-law Amendment application only, based on the current potential concept plan. It is anticipated that additional investigation will be required to support a Site Plan Control application and construction. Such additional investigation will need to be specific to the designs at that future time.

The current potential concept plan was received from the Planner on April 06, 2013 by email. It is attached at the end of this letter for reference. The Project consists of two (2) small commercial or industrial buildings with three units each. Each of the two buildings will be approximately 12 m x 93 m in area and will be aligned east-west on the southern limit of the property. It is understood that the single-storey lightly-loaded structures will designed with conventional shallow foundations founded on the underlying native till. No basements or below grade levels planned. In addition to the structures, the property will be developed with on-grade parking or outdoor storage areas.

This letter is prepared for the sole use of the Client. The use of the letter, or any reliance on it by any third party, is the responsibility of such third party. This letter is subject to the limitations noted herein. It is understood that the Project will be designed in accordance with all applicable codes and standards present within its jurisdiction. Alternate design concepts will require additional investigations which are specific to the design requirements being considered. It is critical to emphasize that future prospective developers will need to perform their own detailed investigations specific to their designs at that time.

At the time of preparation of this letter, TBTE has not been provided with any structural drawings of the proposed foundations for the structures, nor grading plans. Therefore, it is important to emphasize that the general recommendations in this report should be considered as preliminary and conceptual in nature and to support the Zoning By-law Amendment application only. If the project proceeds with the current potential concept plan, then TBTE should be retained to review the proposed foundation drawings and grading plans once they become available to ensure conformance with the general recommendations provided within this letter and the Preliminary Geotechnical Investigation.

Geotechnical Discussion

The following subsections are intended to be an update to and not a replacement of the recommendations in Englobe's 2025 Preliminary Geotechnical Investigation Report. This letter should be read in conjunction with the Report. The structure of this section of the letter references the particular geotechnical comments by the City which affect the design of foundations for the current potential concept plan.

Typographical Notes (Comments 13 and 14)

The title page shows the date January 06, 2024, while the engineering seal is dated January 06, 2025. Please verify.

The date of the stamp and the report are both correct.

Section 4.1 (Geotechnical Drilling Fieldwork) identified Monitoring Well holes as MW20-01 and MW20-06, while the first paragraph of Section 4.1 and the attached plan in the Appendix B (Figure 2), identified them as MW21-01 and MW21-06. Please correct the discrepancies

The two monitoring wells are correctly named as MW21-01 and MW21-06. This is consistent on the borehole logs and the borehole location plan. The references in the Section 4.1 paragraph text are incorrect.

Soil Plasticity (Comment 15)

Provided testing results of the borehole BH21-02 (Table 5-4) indicate that soil between 1.7mbgs – 3.1m bgs is exhibiting liquid-like behaviour (LI = 0.9 to 1.9). Please thoroughly discuss the implications of this finding.

Boreholes BH21-02, BH21-07, and BH21-08 encountered a 2.5 m to 3.0 m thick native clay layer above the till. This clay layer has a desiccated stiff brown crust, becoming an unweathered firm grey clay with depth. This is typical of marine clay deposits in eastern Ontario. Samples BH21-02 SS2 and BH21-02 SS5 had Atterberg limits testing performed and were found to have a moisture content near or above the liquid limit. This is known colloquially as “wet of liquid” and is also typical of the local unweathered clays at depth. The unweathered clay in these boreholes is of medium sensitivity. If it is disturbed by over-excavation, remoulding, equipment or foot traffic, or subjected to excess water, it will lose its initial strength and will need to be sub-excavated. Contractors should use excavation methods that minimize disturbance to clay subgrades. Final excavations in the clay should be performed with a smooth-edged ditching bucket. Based on the moisture content, it is likely that the unweathered clay at these locations, if it is excavated, will not be useful as fill elsewhere on the Site. Furthermore, excavations through unweathered clays may be considered as a “Type 4 Soil” according to Occupational Health and Safety Act of Ontario (OHSA) Regulations for Construction (O.Reg. 213/91).

The current potential concept plan has only two buildings, located along the south limit of the Site. The proposed buildings are located in the vicinity of MW21-06 and BH21-05. No unweathered clays were encountered in these locations.

Liquefaction Screening (Comment 16)

The report did not investigate potential for seismic liquefaction, liquefaction-like behaviour or rapid lowering of shear strength of the soils on site due to seismic activity. Please discuss in the report. Clear conclusions and recommendations need to be provided.

TBTE has performed a screening-level liquefaction review at the two building locations in the current potential concept plan based on the soils encountered in MW21-06 and BH21-05. The

screening was based on *Boulanger and Idriss (2014)* consistent with Canadian Foundation Engineering Manual (CFEM-2023). The conclusions of this screening were that the surficial silty sands above the till at elevation 85.9 masl in MW21-06, and the surficial silts above the till at elevation 84.6 masl in BH21-05 may be potentially liquefiable given the applicable code-based design earthquake. As it is only these surficial soils that are potentially liquefiable, the foundations for these two buildings are therefore recommended to extend down to the underlying till soils.

Again, this letter is intended to discuss the current potential concept plan only to support the Zoning By-law Amendment application. It is anticipated that additional detailed geotechnical investigation will be required to support a Site Plan Control application. Such additional investigation will need to be specific to the building designs at that time and should review liquefaction in other areas of the Site as well.

Construction Dewatering (Comment 17)

Section 6.3 (Dewatering) appears to show that significant dewatering will be required. Please indicate what types of permits will be required and whether the proposed dewatering will have implications on the surrounding area.

Based on the water level in MW21-06 and the moisture observations during drilling in BH21-05 the water level in the vicinity of the two proposed buildings is anticipated at an approximate elevation ear 86.4 masl. The footings are intended to be at approximate elevations of 85.9 and 84.6 masl. This corresponds to 0.5 m and 1.8 m below the water level, respectively. Therefore, construction dewatering will be required to achieve a workable dry excavation. It is expected that a Permit to Take Water (PTTW) will be required to support the temporary construction dewatering. Again, this letter is intended to support the Zoning By-law Amendment application. Future Site Plan Control applications should require construction dewatering quantified as part of their Hydrogeological Investigation at that time to support the required PTTW.

Geotechnical Resistance Values (Comment 18)

Sections 6.4.1 and 6.4.2 assumed 150 kPa ULS and 100 kPa SLS soil bearing pressure resistance. It also stated 19mm to 25mm of expected differential settlement under the foundation walls/pads for the SLS. It is not clear how these values were determined. Please provide calculations and/or rationalize. It is not clear what assumptions were considered in determining the said values.

As discussed above, it is recommended that the buildings be founded on native undisturbed till at approximate elevations near 85.9 masl in MW21-06 and 84.6 masl in BH21-05. The following table presents the recommended geotechnical resistance for shallow foundations founded on native undisturbed till at the specified depths.

Footing Size (m)	Minimum Footing Depth (mbgs)	Factored Bearing Capacity, ULS (kPa)*	Maximum Design Bearing Pressure, SLS (kPa)**
Building 1 (MW21-06), Founding Elevation = 85.9 masl on native undisturbed till			
0.9 m x 0.9 m	1.7 mbgs	259 kPa	173 kPa
1.2 m x 1.2 m	1.7 mbgs	263 kPa	176 kPa
1.5 m x 1.5 m	1.7 mbgs	268 kPa	179 kPa
1.8 m x 1.8 m	1.7 mbgs	272 kPa	181 kPa
2.1 m x 2.1 m	1.7 mbgs	277 kPa	184 kPa
0.6 m strip	1.7 mbgs	171 kPa	114 kPa
0.9 m strip	1.7 mbgs	179 kPa	119 kPa
1.2 m strip	1.7 mbgs	186 kPa	124 kPa
1.5 m strip	1.7 mbgs	193 kPa	129 kPa
Building 2 (BH21-05), Founding Elevation = 84.6 masl on native undisturbed till			
0.9 m x 0.9 m	3.1 mbgs	330 kPa	220 kPa
1.2 m x 1.2 m	3.1 mbgs	334 kPa	223 kPa
1.5 m x 1.5 m	3.1 mbgs	339 kPa	226 kPa
1.8 m x 1.8 m	3.1 mbgs	343 kPa	229 kPa
2.1 m x 2.1 m	3.1 mbgs	347 kPa	199 kPa
0.6 m strip	3.1 mbgs	216 kPa	144 kPa
0.9 m strip	3.1 mbgs	224 kPa	149 kPa
1.2 m strip	3.1 mbgs	231 kPa	154 kPa
1.5 m strip	3.1 mbgs	239 kPa	159 kPa
* ULS bearing capacity includes a geotechnical resistance factor of φ = 0.5.			
** SLS bearing pressure considers a typical 25 mm total and 19 mm differential settlement tolerance. The bearing pressures presented above consider a maximum 0.5 m grade raise in the vicinity of the building. Alternate grading or lower settlement tolerances would require additional investigation.			

Future Site Plan Control Applications will require additional geotechnical investigation and settlement estimates specific to their location, foundation designs, and founding elevations at that time.

Seismic Site Designation (Comment 19)

Section 6.6 categorized the site to be a seismic class "D" (indicative of "stiff soil"). The site data, and earlier discussions in the report, indicate sensitive and extra sensitive soils on site, of high plasticity and likely prone to liquefaction or prone to strain softening. Please provided an extensive rationale in support of the provided classification.

The medium sensitivity and "wet of liquid" unweathered silty clays were encountered in boreholes BH21-02, BH21-07, and BH21-08, which are away from the proposed building locations in the current potential concept plan.

TBTE has estimated the Seismic Site Designation based on the new Ontario Building Code (OBC-2024) for the two building locations MW21-06 and BH21-05. This assessment estimated a Seismic Site Designation of X_C and X_D, respectively. With the exception of the screening level liquefaction review above, the remaining requirements of site designation of $X_{E\ \text{"soft soil"}}$ and $X_{F\ \text{"other soil"}}$ in table 4.1.8.4.A of OBC-2024 were not triggered.

As discussed in comments 16 and 18 above, TBTE performed a screening-level liquefaction review at the two building locations. The conclusions of this screening were that the surficial silty sands and the surficial silts above the till may be potentially liquefiable given the applicable code-based design earthquake. TBTE has therefore recommended that the footings for these buildings be founded at elevations near 85.9 masl in MW21-06 and 84.6 masl in BH21-05 on native undisturbed till. Therefore, all potentially liquefiable soils would be removed from the building footprints resulting in a localized ground improvement. Based on this approach it is concluded that these buildings can continue to be designed considering Seismic Site Designation of X_C and X_D, respectively.

Future Site Plan Control Applications will require additional geotechnical investigation and estimates of seismic site designation specific to their location and foundation designs at that time.

Foundation Drainage (Comment 20)

Section 6.8 stated that permanent drainage with a frost-free outlet will be required. With Options 1 and 2 and consequently deep foundations, it is not clear how the gravity flow to an outlet will be achieved and if its feasibility was contemplated. It is not clear if the proposed foundation drainage will impact the surrounding area clays (excessive settlement) and what mitigation measures might need to be implemented. Please discuss and provide related recommendations in the report. If the use of sump pumps is anticipated, please include it in the discussion, also noting that the sump pumps will need to be equipped with a back-up system with an alarm and independent power supply, per Ottawa Sewer Design Guidelines, Second Edition, October 2012, with bulletins.

The current potential concept plan has only two buildings, located along the south limit of the Site. The buildings are intended to be single-storey slab-on-grade structures with no basement level. Buildings with no basement levels and a floor slab set at least 0.3 m above the exterior grade generally do not require perimeter drainage.

Clay Seals (Comment 21)

Section 6.11.3 states that clay seals will be needed for any utility trenches. Does that also apply to the deep foundation drainage?

Buildings with no basement levels and a floor slab set at least 0.3 m above the exterior grade generally do not require perimeter drainage. Therefore, no perimeter drainage is anticipated for the buildings in the current potential concept plan.

Preliminary Reporting Only (Comment 22)

It is understood that this is a preliminary report, and it will have to be developed further as part of future SPC application(s) when the proposed soil loading will be known. Section 6t proposes three options for subgrade preparation. This approach is acceptable for the ZBA; however, as part of future SPC application(s), the approach will need to be discussed with the site owner and

the preferred/proposed method will need to be established (excavation type (1 or 2) or piles), and especially that localized cobbles and boulders were encountered on-site

This letter is intended to discuss the current potential design concept plan only to support the Zoning By-law Amendment application. It is anticipated that additional geotechnical investigation will be required to support a Site Plan Control application. Such additional investigation will need to be specific to the building designs at that time.

Slope Stability (Comment 23)

A Slope Stability Study will be required as part of future SPC application(s), as it is understood that there are steep slopes at the edges of the fill adjacent to the watercourses on-site.

This letter is intended to discuss the current potential concept plan only to support the Zoning By-law Amendment application. It is anticipated that additional geotechnical investigation will be required to support a Site Plan Control application. Such additional investigation will need to be specific to the designs at that time and may require slope stability assessments depending on the geometry and proximity to significant grade changes.

Limitations

This letter was prepared for the exclusive use of Dilworth Developments Inc. No third party is entitled to rely upon this report without the knowledge and consent of TBTE. Any such consensual reliance upon this report would be subject to the same contractual, technological and other limitations that governed the assessment and report.

This report is based on information primarily obtained from a review of relevant historical investigations and data sources referenced herein. The conclusions presented reflect the site conditions observed and reported at the time of the investigation and are supplemented by available background information. No assurances can be made regarding changes in site conditions occurring after the time of TBTE's investigation.

In evaluating the project area, TBTE has relied in good faith upon information provided by others. TBTE accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omission, misinterpretation or fraudulent act of the persons interviewed.

Where references have been made to regulatory statutes, codes, guidelines and the like, note that these regulations are subject to interpretation and the regulations and their interpretations can change over time.

Closure

We trust the above information meets your current requirements. Please do not hesitate to contact us if there are any further questions.

Yours very truly,

TBT Engineering Limited

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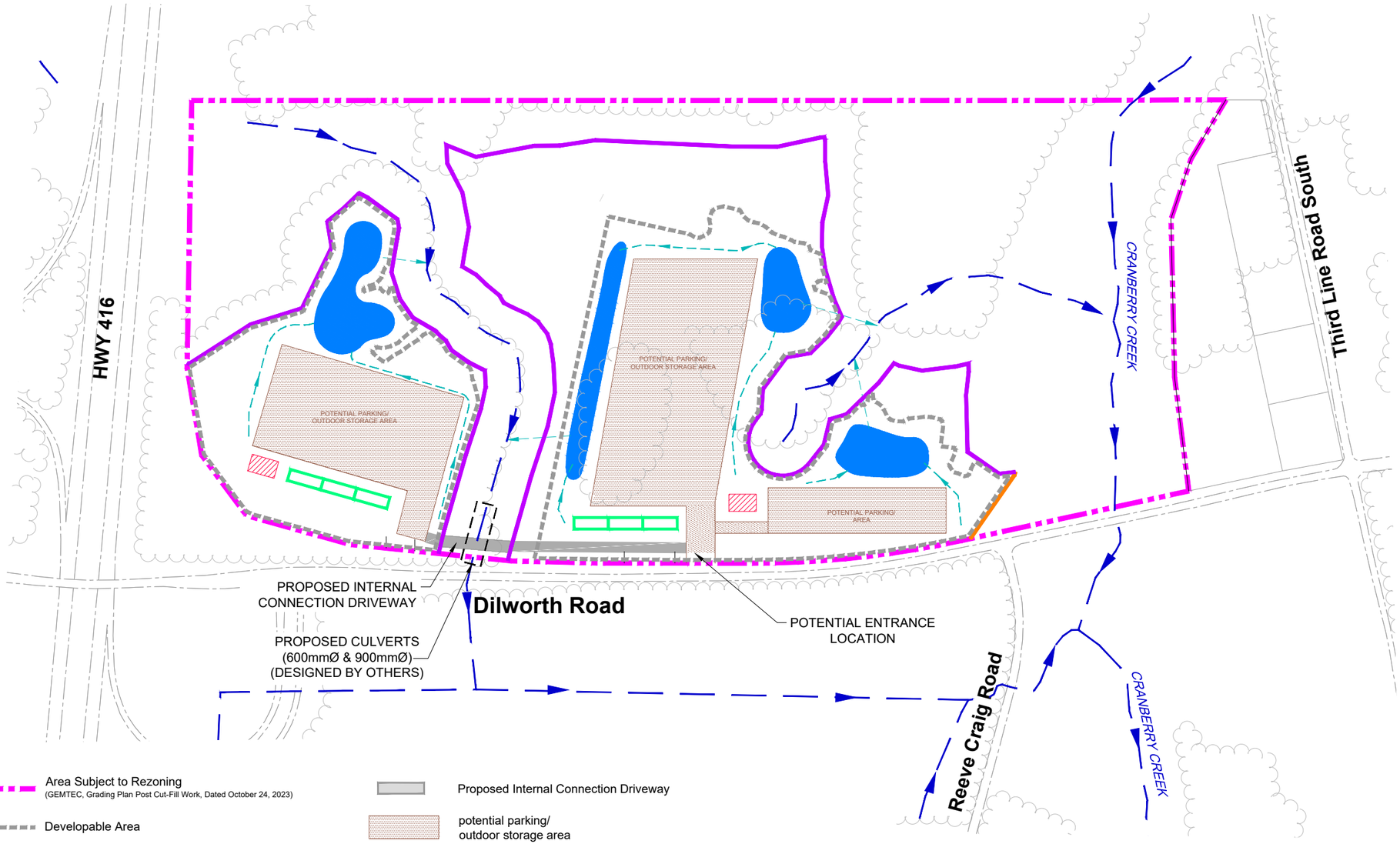
Attachments:
Current Potential Concept Plan



LEGEND

- Area Subject to Rezoning (GEMTEC, Grading Plan Post Cut-Fill Work, Dated October 24, 2023)
- Developable Area
- 30m Setback (From Local Wetland/Watercourse) (GEMTEC, Grading Plan Post Cut-Fill Work, Dated October 24, 2023)
- 50m Setback (From Provicially Significant Wetland) (GEMTEC, Grading Plan Post Cut-Fill Work, Dated October 24, 2023)
- Watercourse (GEMTEC, Grading Plan Post Cut-Fill Work, Dated October 24, 2023)
- Treeline (GEMTEC, Grading Plan Post Cut-Fill Work, Dated October 24, 2023)
- Proposed Internal Connection Driveway
- potential parking/ outdoor storage area
- potential storm pond area
- potential footprint for building occupancies
- potential septic system area
- potential swale to storm pond area

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2095 DILWORTH ROAD

CONCEPT PLAN

SCALE 1 : 4000 (0, 40, 80, 120, 160)
DATE APR 2026
JOB 123081
FIGURE 4