

November 6, 2024

Reference No. G3584-5-3

GEI Consultants Canada Limited
650 Woodlawn Road West
Block C, Unit 2
Guelph, Ontario
N1K 1B8

Attention: Mrs. Angela Kroetsch, Vice President-Land Development
Via Email: AKroetsch@geiconsultants.com

**RE: Desktop Slope Stability Study
Proposed Hillsburgh Subdivision
9354 Wellington Road 22, Erin, ON**

Dear Ms. Kroetsch,

JLP Services Inc. (JLP) was retained by GEI Consultants Canada Limited (GEI) on behalf of Thomasfield Homes Limited (Thomasfield) to provide geotechnical opinion pertaining to the slope stability and development setback requirements for the sloping ground profiles to the north of the proposed subdivision beyond the northwest quadrant of the subject site, Lots 1 through 17 inclusive.

It is understood that the development application for the proposed subdivision at the subject property is under review by the Credit Valley Conservation (CVC) Authority. Based on the correspondences and information provided by the CVC:

- A fifteen (15) metre development setback is required from the CVC top of bank;
- A vegetation limit buffer of ten (10) metres is to be applied to the CVC vegetation limit; and,
- The required setback is equal to whichever is greater of the two (15m setback from the top of bank or 10m buffer from the vegetation limit).

The proposed Lots 1 through 17, located near the northwest corner of the proposed subdivision will extend over an adjacent property abutting an existing slope towards the Credit River (Erin Branch) on the northern side of the property. The location of the proposed Lots 1 through 17 is indicated in the Site Plan, Enclosure 1.

The following documents were reviewed in preparation of this Slope Stability Study:

1. Preliminary Geotechnical investigation, titled '*Preliminary Geotechnical Investigation, Proposed Residential Subdivision, 9354 Wellington Road 22, Town of Erin (Hillsburgh), Ontario*', prepared by V.A. Wood (Guelph), Reference No. G3584-5-4, dated April, 2015.
2. Hydrogeological Investigation, titled '*Hydrogeological Study for Proposed Residential Subdivision: Part of Lot 23, Concession 7, Town of Erin (Hillsburgh)*', prepared by GM Blueplan Engineering Limited, GMPB file 121132, dated October 3, 2023.
3. Topographic Plan, titled '*Topographic Plan of Survey of Part of Lot 23, Concession 7 (Geographic Township of Erin) Town of Erin, County of Wellington*', prepared by Van Harten Surveying Inc., Project No. 23602-16, dated January 16, 2023.
4. Development Concept Site Plan, titled '*Development Concept – Barden Hillsburgh Subdivision*', prepared by GSP Group, Project No. 20200, dated September 28, 2022.

Based on the available CVC mapping, the northern boundary of the subject property is located within the regulation limit of the CVC.

JLP carried out a visual inspection at the property on September 10, 2024, and noted the following:

- The subject property is located on the western side of Wellington Road 22, between Sixth Line and Trafalgar Road (County Road 24).
- The ground surface slopes from the southern property line towards the northern property boundary towards the Credit River (Erin Branch).
- A residential dwelling was noted on the southeastern corner of the subject property, near proximity to Wellington Road 22.
- It was noted that the predominant portion of the site was used for agricultural purposes and a pathway along the perimeter of the site was cleared for pedestrian use.
- The adjacent property north of the northern perimeter boundary contained mature trees and shrubs and also a watercourse (Credit River [Erin Branch] and ponds).
- A walkthrough of the northern adjacent property indicated that there is no sign of instability or distress of soil slope towards the northern property boundary (Lots 1 through 17).
- The existing sloping ground surface towards the northern neighboring property was evaluated using Table 8.1 - Slope Stability Rating Chart outlined in the "*Geotechnical Principles for Stable Slopes*" by the Ministry of Natural Resources (MNR) dated November 1997. The total rating value was found to be between "25 and 28", see Enclosure 3.

Based on the available data (topographic map, previous Geotechnical/ Hydrogeological Investigation data, proposed development plan and CVC mapping), JLP conducted a desktop slope stability study from the northern property boundary towards the Credit River (Erin Branch) located on the northern adjacent property. The existing slope was evaluated at three (3) selected locations along Lots 1 through 17. The

approximate locations where the ground surface profiles were established, and the corresponding cross-sections (A to A', B to B' and C to C') are presented in Enclosures 1 and 2.

In general, the slope of the existing ground surface towards the tributary of the Credit River (Erin Branch) ranges approximately from 1 (vertical) to 6 (horizontal) to 1 (vertical) to 20 (horizontal) along Cross-sections A-A', B-B' and C-C'.

It was observed that the slope of the existing ground surface was covered with surface vegetation including grass and matured shrubs and trees. No visible sign of active erosion of the sloping ground surface and floodplain areas was observed.

Based on the visual observation and findings of the desktop slope stability study, it is our opinion that:

- The existing slope extending from the top of bank towards the toe (in the near vicinity of the Credit River [Erin Branch]) evaluated at three cross sections (A to A', B to B' and C to C') appear to be gradual in nature with slope inclination of approximately 1(vertical) to 6 (horizontal) and flatter.
- The development setback distance from the assumed "stable top of bank" of fifteen (15) metres may be reduced or waived as the risk of deep-seated or shallow failure of the existing slope is minimal.
- A ten (10) metre total setback/buffer from the "CVC top of bank", which aligns with the "CVC vegetation limit", is recommended as a combined development setback and vegetation limit buffer.

Considering that the gradient of the existing slope to the north of the proposed subdivision is gradual, with no observed signs of erosion and/or instability; the existing vegetation over the slope enhancing stability of the slope and mitigating risks associated with surface erosion; and the design of the proposed development incorporates a stormwater management plan to divert surface runoff away from the slope, a reduction in the required development setback from stable top of bank from 15 meters to 10 meters is acceptable in geotechnical standpoint.

Trust that this report meets your requirements and is satisfactory to you. Should you have any questions, please do not hesitate to contact this office.

Sincerely,
JLP Services Inc.



Phivos Brodsgaard, B.S.C.E., EIT
Field Supervisor



Alexander Lee, M.Sc. (Eng.), P.Eng.
Senior Geotechnical Engineer



List of Enclosures

- Enclosure 1 – Site Plan
- Enclosure 2 – Slope Cross Sections
- Enclosure 3 – MNR Slope Stability Rating Chart

List of Appendices

- Appendix A – Limitations and Use of Report

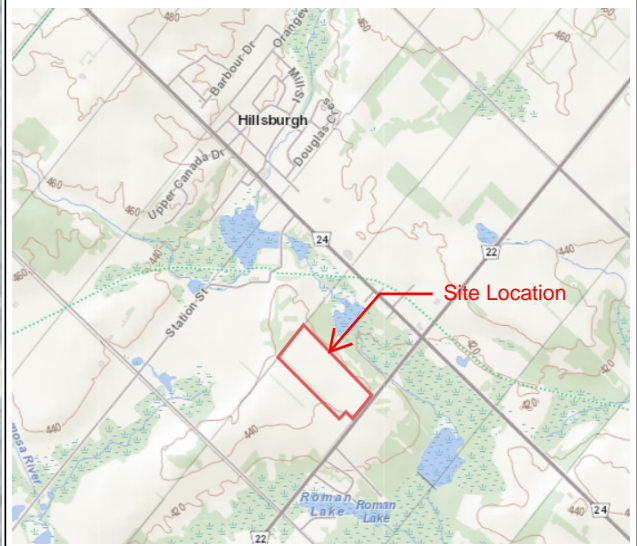
Enclosures



Legend

- - - - - Property Limit
- Cross Section Axis
- Lots 1 through 17 of proposed development

Key Map



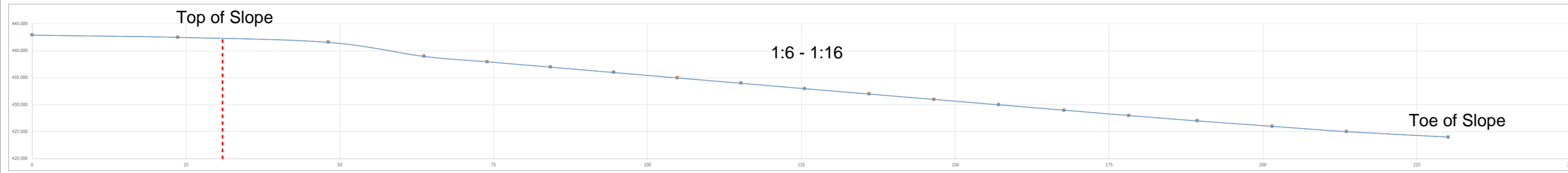
Site Plan
Proposed Subdivision
9354 Wellington Road 22,
Erin, Ontario

Date: Nov 4, 2024	Ref. No. G3584-5-3		
Prepared By: CL	Checked By: AL	Encl. No.	1
Source: Google Earth (2023) JSP Geos. Development Concept (Sept. 2023)	Scale: 		

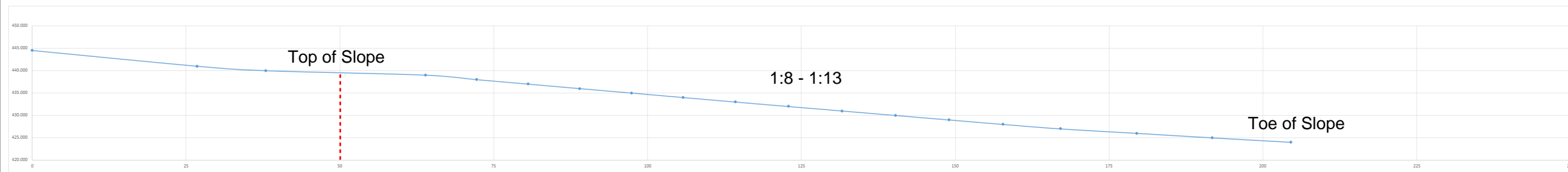
Legend

- Cross Section
- - - Property Line

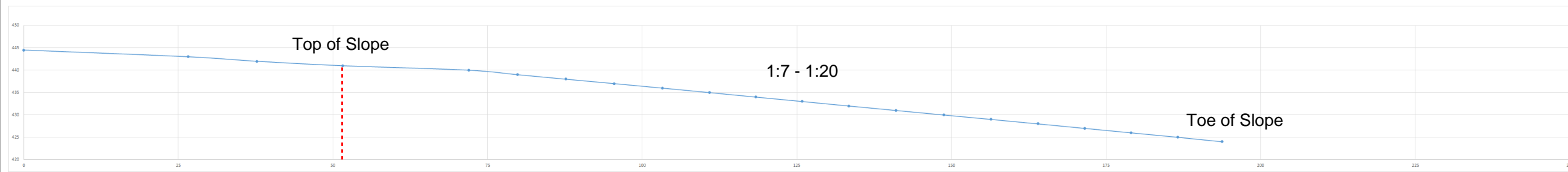
Cross Section A-A'



Cross Section B-B'



Cross Section C-C'



Cross Sectional Views
Proposed Subdivision
9354 Wellington Road 22,
Erin, Ontario

Date: Nov. 4, 2024	Ref. No. G3584-5-3	
Prepared By: PB	Checked By: AL	Encl. No. 2
Source: Google Earth	Scale:	

TABLE 8.1 - SLOPE STABILITY RATING CHART

Site Location: 9354 Wellington Road, Erin, ON		File No. G3584-5-3	
Property Owner: Thomasfield Homes Limited		Inspection Date: September 10, 2024	
Inspected By: AL/AJ		Weather: Sunny 20°C	
1.	SLOPE INCLINATION degrees a) 18 or less b) 18 - 26 c) more than 26	horiz. : vert. 3 : 1 or flatter 2 : 1 to more than 3 : 1 steeper than 2 : 1	Rating Value 0 6 16
2.	SOIL STRATIGRAPHY a) Shale, Limestone, Granite (Bedrock) b) Sand, Gravel c) Glacial Till d) Clay, Silt e) Fill f) Leda Clay		0 6 9 12 16 24
3.	SEEPAGE FROM SLOPE FACE a) None or Near bottom only b) Near mid-slope only c) Near crest only or, From several levels		0 6 12
4.	SLOPE HEIGHT a) 2 m or less b) 2.1 to 5 m c) 5.1 to 10 m d) more than 10 m		0 2 4 8
5.	VEGETATION COVER ON SLOPE FACE a) Well vegetated; heavy shrubs or forested with mature trees b) Light vegetation; Mostly grass, weeds, occasional trees, shrubs c) No vegetation, bare		0 4 8
6.	TABLE LAND DRAINAGE a) Table land flat, no apparent drainage over slope b) Minor drainage over slope, no active erosion c) Drainage over slope, active erosion, gullies		0 2 4
7.	PROXIMITY OF WATERCOURSE TO SLOPE TOE a) 15 metres or more from slope toe b) Less than 15 metres from slope toe		0 6
8.	PREVIOUS LANDSLIDE ACTIVITY a) No b) Yes		0 6
	SLOPE INSTABILITY RATING	RATING VALUES TOTAL	INVESTIGATION REQUIREMENTS
			TOTAL 25 to 28
1.	Low potential	< 24	Site inspection only, confirmation, report letter.
2.	Slight potential	25-35	Site inspection and surveying, preliminary study, detailed report.
3.	Moderate potential	> 35	Boreholes, piezometers, lab tests, surveying, detailed report.
NOTES:	a) Choose only one from each category; compare total rating value with above requirements. b) If there is a water body (stream, creek, river, pond, bay, lake) at the slope toe; the potential for toe erosion and undercutting should be evaluated in detail and, protection provided if required.		

Appendix A – Limitations and Use of Report

REPORT TERMS AND CONDITIONS

NOTICE: THE FOLLOWING PROVISIONS SET FORTH IMPORTANT QUALIFICATIONS AND LIMITATIONS ON THE FINDINGS AND RECOMMENDATIONS IN THE REPORT AS WELL AS THE USE OF, AND RELIANCE ON, THE REPORT.

1. **DEFINITIONS.** The following capitalized terms have the following meanings:
 - (a) **“Additional Investigations”** means investigations that JLP has indicated to the Client should be undertaken to take into account any Out-of-Scope Requirements, but that are not otherwise specifically within the scope of investigations conducted for the purpose of the Report.
 - (b) **“Applicable Laws”** means and includes without limitation all applicable provincial laws, regulations, guidelines, policies, standards, protocols, and objectives administered by the Ministry of the Environment and Climate Change or any other duly-constituted governmental authority, all as in force as of the date of the Report.
 - (c) **“Client”** means the Client as referred to in the Report.
 - (d) **“Client Information”** means the information, representations, and instructions provided by the Client, the Client’s representatives, and/or others and upon which the Report is based, in whole or in part.
 - (e) **“Findings”** means the evaluations and conclusions set forth in the Report.
 - (f) **“JLP”** means JLP Services Inc.
 - (g) **“Out-of-Scope Requirements”** means special concerns or requirements of the Client in respect of the subject matter of the Report.
 - (h) **“Recommendations”** mean the findings and recommendations referred to in the Report, taking into account any Out-of-Scope Requirements that were disclosed to JLP prior to the date of the Report.
 - (i) **“Report”** means the report to which these Terms and Conditions are attached and form part.
 - (j) **“Report Documents”** means the underlying documents, records, data, and files, in any medium whatsoever, generated in connection with the preparation of the Report, including without limitation, the instructions and objectives communicated to JLP by the Client, communications between JLP and the Client, and other reports, proposals, or documents prepared by JLP for the Client in connection with the Site.
 - (k) **“Site”** means the site in respect of which the Report was prepared.
 - (l) **“Site Conditions”** means Site conditions known as a result of, or reasonably imputed by, the investigations that were undertaken as of the date of the Report.
2. **BASIS OF REPORT.** The Report is based on the Site Conditions. Any changes to the Site Conditions after the date of the Report that could or will affect the Site Conditions may or will have a corresponding effect on the Recommendations. The Report does not take into account any (a) Additional Investigations that were not undertaken, or (b) Out-of-Scope Requirements that were not communicated prior to completion of the investigations that were been undertaken as of the date of the Report. Where recommended field services are referred to, they are the minimum services necessary to determine compliance of construction with Applicable Laws, generally accepted industry-standard practices, and the Recommendations.
3. **RELIANCE & USE.** The Report has been prepared only for the Site and the related design, development, building, or building assessment objectives identified by the Client. The Findings and Recommendations are based on the Site Conditions and the Client Information. In preparing the Report, JLP has relied upon the Client Information and disclaims any responsibility for any inaccuracy, misstatement, omission, unintentional misrepresentation, or other deficiency contained in the Report as a result of such reliance. Unless specifically stated otherwise, the applicability and reliability of the Findings and the Recommendations expressed in the Report are only valid to the extent that (a) there has been no material change to or variation from any of the Client Information, (b) the Client Information contains no untrue statement of a material fact, or (c) the Client Information omits no statement of a material fact necessary in order to make the Client Information not misleading.

The Report and the Findings and Recommendations are for the sole benefit of the Client. No other party may use or rely upon the Report in whole or in part without the prior written consent of JLP, which may be arbitrarily withheld or conditioned.

RELIANCE UPON THE REPORT OR ANY OF THE DETERMINATIONS MADE HEREIN BY A THIRD PARTY WITHOUT JLP'S CONSENT IS PROHIBITED AND JLP MAKES NO REPRESENTATION, GUARANTEE, OR WARRANTY IN FAVOUR OF ANY THIRD PARTY WITH RESPECT TO THE REPORT WHATSOEVER. JLP FULLY DISCLAIMS, AND WILL HAVE NO LIABILITY FOR, ANY LOSS, DAMAGES, OR EXPENSES WHICH ANY THIRD-PARTY MAY INCUR OR SUFFER AS A RESULT OF THE USE OF OR RELIANCE ON THE REPORT WHERE JLP HAS NOT EXPRESSLY AUTHORIZED SAME. ANY THIRD PARTY WHO RELIES ON THE REPORT TO ANY EXTENT DOES SO AT SUCH PARTY'S OWN RISK AND COMPLETELY WAIVES ANY AND ALL CLAIMS AGAINST JLP IN CONNECTION WITH THE REPORT, REGARDLESS OF THE THEORY OF LAW (WHETHER IN CONTRACT, TORT, OR ANY THEORY OF LAW COMING INTO EXISTENCE HEREAFTER).

4. **STANDARD OF CARE.** The Report has been prepared in a manner consistent with the degree of care and skill exercised by engineering consultants currently practicing under similar circumstances. No other warranty, expressed or implied, is made or intended in the Report. It is intended that the Findings and Recommendations are meant to assist in reducing the Client's risk associated with environmental impairment at the Site. The Report should not be considered risk mitigation.
5. **ENTIRE REPORT.** The Report also includes the Report Documents. In order to properly understand the Findings and Recommendations, reference must be made to the Report in its entirety. JLP is not responsible for use by any party of a part of the Report only.
6. **GOVERNING FORMAT.** Notwithstanding that JLP may have submitted an electronic version of the Report or any document forming part of the Report, only the signed and sealed physical copy of the Report shall be deemed to be the original and in the event of any dispute or discrepancy, the physical copy shall govern. JLP makes no representation about the compatibility of its electronic or digital file format with the Client's current or future software and/or hardware systems. The documents described herein are JLP's instruments of professional service and shall not be altered without the written consent of JLP.
7. **GENERAL LIMITATIONS.**
 - (a) Unless specifically stated otherwise, the Report does not contain environmental consulting advice.
 - (b) The Report contains no opinion or determination as to any matters governed by laws other than the laws of the Province of Ontario and the federal laws of Canada applicable therein as of the date hereof.
 - (c) During any future development of the Site, conditions not observed during JLP's investigations may become apparent. If this occurs, JLP should be contacted to assess the situation and whether there is a need for additional testing.
 - (d) JLP's investigations were carried out to address the intent of Applicable Laws, which are subject to change, and such changes, when coming into legal force and effect, could alter the Findings and Recommendations in a material way.
 - (e) Achieving the objectives stated in the Report has required JLP to arrive at conclusions based upon the best information presently known to JLP. Current investigative methodologies do not completely eliminate the possibility of imprecise or incomplete information. Rather, they merely reduce such possibility to acceptable levels. Professional judgment was exercised in gathering and analyzing information obtained and in the formulation of the Findings. JLP does not act as an absolute insurer of the Findings and will only be responsible for gross negligence with respect thereto.
 - (f) The Report may not be reproduced in whole or in part by any party other than the Client without JLP's prior written consent. All intellectual property rights in the Report are reserved to JLP.