GEI Consultants

November 10, 2023

Carringwood Homes
101 Regent Street
Richmond Hill, Ontario
L4C 9P4

Attention: Rob Fernicola, President

Dear Mr. Fernicola,

RE: Fluvial Geomorphic Site Visit – Drainage Feature, Tributary of Beeton Creek, 10249 Hunsden Sideroad (GEI PN2101948)

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1. INTRODUCTION

GEI Consultants Ltd. (GEI) completed a fluvial geomorphic assessment for the property located at 10249 Hunsden Sideroad, Bolton (herein referred to as the Subject Lands, depicted in **Figure 1**). The 20.37 hectare Subject Lands are generally located on the south side of Hunsden Sideroad, between Mount Wolfe Road and Mount Pleasant Road, and are legally described as Part Lots 25 and 26, Concession 9, in the Town of Caledon, and the Regional Municipality of Peel.

The Subject Lands currently contain a residential dwelling on the northeast corner of the property, woodlots in the northeast and the southeast regions, and an agricultural field on the western half. A small residential lot exists along Hunsden Sideroad, jutting into the Subject Lands. The area surrounding the Subject Lands consists mainly of agricultural lands, with some woodlots and residential dwellings.

It is understood that Carringwood Homes is proposing the development of eighteen residential lots, one Storm Water Management Pond, and an internal roadway. The lots will be municipally serviced with water, but not municipal sanitary sewers, such that private septic beds will be required on each residential lot.

A small first-order channel tributary of Beeton Creek is located at the northeast corner of the Subject Lands, flowing from agricultural lands northeast of and across the Subject Lands. A second, smaller drainage feature flows from the woodlot within the northeast corner of the Subject Lands, converging with the larger drainage feature noted above. Beeton Creek and its tributaries fall under the jurisdiction of the Nottawasaga Valley Conservation Authority (NVCA). Mapping prepared by the NVCA (NVCA 2023) indicates that the larger drainage feature has been identified as a regulated watercourse.

Figure 1: Study Location.

GEI previously completed a fluvial geomorphic assessment, dated November 17, 2022 (GEI 2022), to document the existing geomorphic status of the features on the Subject Lands, and to develop an erosion threshold, to inform the stormwater management plan for the proposed development.

The NVCA has provided comments on the first Draft Plan of Subdivision and Zoning By-law Amendment Application for the Study Area. Specifically, the following comment, pertains to the fluvial geomorphic assessment of the watercourses in the Study Area:

1. *Natural Hazard Study: Please provide a signed and sealed copy of the natural hazard assessment for the erosion hazard associated with the tributary of Beeton Creek noted on the Site. Please provide a signed and sealed delineation of the hazard limit, and please including the set-back limit in the assessment. This limit delineation is a component of confirming the NHS block is sufficiently sized to contain the hazard limit.*

The current fluvial geomorphic assessment is intended to build on the previous assessment and provide an opinion regarding the status of the drainage feature within the Subject Lands, and specifically whether an erosion hazard should be applied to the feature.

2. METHODS

A geomorphic field assessment was completed for the feature on November 11th, 2022, to document existing conditions from a fluvial geomorphic perspective, and to determine the current regime status and channel health. The geomorphic assessment consisted of the identification of the presence or absence of geomorphic elements, such as defined bed and banks, as well as documenting any active geomorphic processes. In addition to the field assessment, a review of historical aerial imagery was performed. Present-day conditions were observed from 2022 imagery provided by First Base Solutions and were compared with imagery from 1954 (from the University of Toronto Imagery database), 1988 (from the National Air Photo Library), and 2002 (also from First Base Solutions).

Reaches were delineated for the previous geomorphic assessment (GEI 2022), and the reach nomenclature were used for this assessment, for consistency (**Figure 2).**

Figure 2: Reaches within the Subject Lands.

The reaches were identified as follows:

Reach DC-01: Begins within the northeast woodlot of the Subject Lands, flowing northwest from the woodlot area towards an existing residence. This short drainage feature consists of less than 120 metres of poorly defined channel. Reach DC-01 terminates at the confluence with Reach DC-02a.

Reach DC-02a: Begins some 720 metres east of the approximate property line for the Subject Lands. It flows across mostly agricultural lands (with photogrammetric evidence of being tilled or ploughed through) and into the woodlot of the Subject Lands. The channel is slightly defined in the woodlot area but exits to a manicured lawn that shows little definition beyond that of a shallow swale. Reach DC-02a flows for approximately 30 metres from the Subject Lands' property line to the confluence with Reach DC-01.

Reach DC-02b: Begins at the confluence of Reaches DC-01 and DC-02a, flowing northwestward to the Hunsden Sideroad culvert crossing at the edge of the Subject Lands. This poorly defined channel flows next to manicured lawn areas but is situated at the edge of the Subject Lands' woodlot area.

The historical imagery analysis provides information regarding the evolution of the site over the course of time and provide insight into how past channel adjustments and modifications have contributed to current channel form and processes. In 1954, residential dwellings were limited in quantity, and the dominant land use surrounding the Subject Lands was agricultural. Land use within the Subject Lands appear similar to present day conditions, except for the absence of residential developments. While drainage features could not be discerned, Beeton Creek could be seen to the north of the Subject Lands, crossing the CP and CN rail tracks and Highway 9. By 1988, some roadways and small houses had been built along Hunsden Sideroad, including on the Subject Lands. Drainage features within the Subject Lands could not be discerned. Beeton Creek to the north also appeared to have lost definition, a change coinciding with the expansion of a lake to the north of the Subject Lands. Land use remained mostly unchanged through 2002 and 2022. The drainage features remained poorly defined within the Subject Lands.

Apart from the short (~30 m) Reach DC-02a, where the channel is slightly defined, the features are poorly defined within the confines of the Subject Lands. All three reaches exhibit regular accumulations of leaf litter with some fallen large woody debris. There is no evidence of erosional scour within the feature, and the accumulation of organic debris suggests that little stream power exists. Almost no evidence of entrenchment or bank definition was noted along the feature.

From the field visit, it was apparent that the drainage features that exist within the Subject Lands are currently experiencing no evidence of erosion (degradation) or sediment accumulation (aggradation). Morphologically poorly defined channels and drainage features are stable and graded. Furthermore, there is no evidence of channel widening due to changes in hydrologic driving conditions or evidence of planimetric form adjustment via changing sinuosity due to changes in driving factors. On the day of the assessment, no flow was observed in any reaches of the feature.

3. CONCLUSIONS AND RECOMMENDATIONS

GEI was retained by Carringwood Homes to complete a fluvial geomorphic site assessment for the property located at 10249 Hunsden Sideroad. Two drainage features were noted in online mapping available for the site, which drain towards Beeton Creek from east to west across the Subject Lands, collecting water from upstream agricultural fields. Regulatory mapping prepared by the NVCA noted that the drainage feature may be a regulated watercourse. This fluvial geomorphic assessment was completed to review existing site conditions and provide an opinion on the drainage features from a geomorphic perspective.

The site assessment was completed on November 11, 2022, to document existing conditions from a geomorphic perspective, and to determine current regime status and stream health. The geomorphic assessment consisted of confirming the presence or absence of geomorphic elements such as defined channel bed or banks and identifying any active geomorphic processes.

No significant morphological elements required to define the features as watercourses were found. Flow paths, identified through changes in vegetation and soil saturation were not well defined and did not exist in topographical depressions. Slight channel definition was only observed in a short, 30 m stretch in the north of the site, while banks were not defined for the majority of the feature. The presence of organic debris, as well as the absence of flow, indicate insignificant fluvial activity throughout this feature.

It is our opinion that the feature investigated in this study should not be identified as a watercourse, and therefore do not have an erosion hazard associated with them.

Yours truly,
GEI Consultants

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