



August 10, 2022

Municipality of Port Hope  
56 Queen Street  
Port Hope, ON, L1A 3Z9

**Attention: Municipality of Port Hope**

**CC: Mr. Jamie Ferguson, Owner, Ferguson Market**

**Re: Ferguson Market Site Drainage**

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To whom it may concern,

On behalf of Mr. Jamie Ferguson, Monument Geomatics & Estimating Inc. (Monument) has investigated the impact of the construction of a farmer's market building on the drainage pattern of the site and surrounding area. It was determined that new building would not adversely impact the drainage pattern of the site or surrounding area, as such no stormwater management (SWM) control measures for the site are proposed. Background information and a summary of the calculation process are presented below.

### **Background**

Mr. Ferguson contacted Monument to investigate if the new construction of a farmer's market building would negatively impact the overland drainage of the site and surrounding area, and if so, what SWM measures would be required to mitigate the impact. The building was constructed in a field located at the east corner of Ganaraska Road and Hammill Road, in the Municipality of Port Hope. The field is roughly 4.3ha in size, while the newly constructed building is 440m<sup>2</sup> (4740sqft) with a 60m gravel driveway that fronts on Ganaraska Road. Monument staff conducted a topographic survey of the site on July 27, 2022 to obtain relevant site information. At the time of the survey, the building was enclosed from the exterior. The hole for the septic tile field, which is east of the building, was being dug. Finish grading immediately north and east of the building remained to be completed using material from a stockpile located east of the septic tile field.

## **Discussion & Conclusions**

To assess if the new building would create a negative impact on the drainage pattern of the area, the overland drainage route was analyzed to determine what was downstream of the site. The pre-construction and post-construction runoff flows were then compared to see if there would be an appreciable increase in runoff flow leaving the site.

The overland drainage route for the site was analyzed using the survey collected topographic information. The site slopes from south to north and has two low points at the north edge of field. Runoff outlets from these low points and enters an unnamed creek roughly 50m north of the site. This unnamed creek flows into the Garden Hill Reservoir, located 300m to the east. The drainage route for the site was confirmed using OFAT (Ontario Flow Assessment Tool), which delineates watersheds that contribute to creeks, streams, rivers, and lakes in Ontario. Figures 1 and 2, which illustrate the site location and overland flow route, respectively, are enclosed.

The construction of the new building on site does not significantly alter the site drainage pattern. Runoff will still reach the two low points at the north end of the field. Once the septic tile field is installed and the grading within the vicinity of the building is finished, there will no longer be any local low points and runoff will be directed away from the building. Runoff from the building's roof, the gravel driveway and the gravel parking lot has an overland conveyance route of 130m through the farm field before reaching the low point outfalls, which will provide ample opportunity for infiltration prior to exiting the site.

For new developments, the post-construction runoff rate is compared to the pre-construction runoff rate to determine what level of quantity control is required to prevent negative impacts downstream. The pre- and post-construction peak runoff flows for the site were computed using the Rational Method and are displayed in Table 1.

Table 1: Peak Flows

Return Period (Years)	Pre-Construction		Post-Construction		Peak Flow Difference	
	Runoff Coefficient	Peak Flow (m <sup>3</sup> /s)	Runoff Coefficient	Peak Flow (m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
5	0.28	0.186	0.31	0.214	0.028	15%
100	0.34	0.434	0.39	0.500	0.066	15%

As shown in Table 1, the increase in peak runoff flow due to the construction of the building is 0.028m<sup>3</sup>/s for the 5-yr storm event, and 0.066m<sup>3</sup>/s for the 100-yr storm event. Since the increase in peak flows due to construction are minimal, no quantity control measures are required. This scenario is similar to the new construction of individual rural homes, which also produce minimal increases in runoff and do not require quantity control. Additionally, there is ample opportunity

for runoff to infiltrate in the 130m flow route through the field and 50m flow route through the wooded area before reaching the unnamed creek. However, there will be storm events that produce enough rainfall to result in runoff flowing into the unnamed creek. In these cases, it is disadvantageous to provide quantity control on site because the site is located at the lower reach of the unnamed creek's watershed, immediately upstream of the Garden Hill Reservoir. If on-site quantity control were provided, the peak outflow from the site would be brought closer in timestep with the peak flow of the unnamed creek.

We trust this letter meets your requirements to assess the drainage pattern for the Ferguson market site on Ganaraska Road. If you should have any further questions, please feel free to contact the undersigned.

Sincerely,



Cody Oram, P.Eng.  
Sr. Project Manager  
Monument Geomatics & Estimating Inc.

Enclosures:

- 1) Figure 1: Site Location
- 2) Figure 2: Overland Flow Route

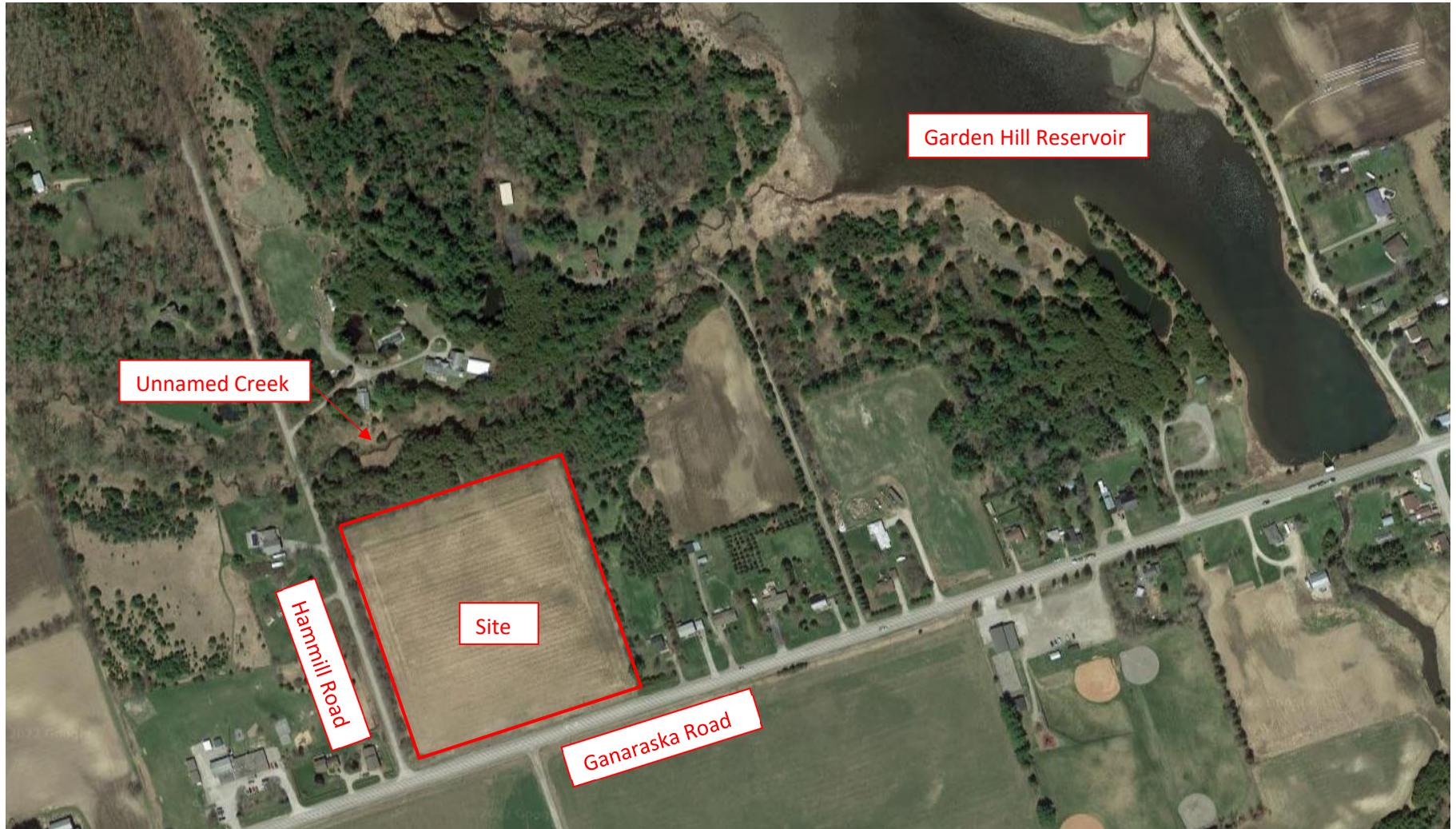


Figure 2: Site Location