

File 420356

October 29, 2020

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Re: Mapleview Essa Development, City of Barrie  
Preliminary LID Assessment and Spill Contingency Plan

Dear Blake:

In support of the proposed Mapleview Essa mixed-use development located in the City of Barrie, we have prepared this Preliminary Low Impact Development (LID) Assessment and Spill Contingency Plan to fulfill the requirements of the zoning by-law amendment (ZBA) application for the proposed development.

## **SETTING**

### **Site Description**

The site is located at the northeast corner of the intersection of Mapleview Drive West and Essa Road, in the City's south end. The 10.19 ha site is bisected by a headwater tributary of Bear Creek, which flows westerly draining into the Nottawasaga River and eventually Georgian Bay. The site is located within the Nottawasaga Valley Conservation Authority (NVCA) watershed. Due to the existing channel and associated floodplain hazard, the majority of the site is located within the NVCA regulated area.

As per the South Georgian Bay Lake Simcoe Source Water Protection Plan, the site is located within a Highly Vulnerable Aquifer (HVA), as well as Wellhead Protection Area Q2 (WHPAQ2). The implications for development within these areas is discussed below with respect to infiltration-based LID controls.

### **Proposed Development**

The proposed development is to be comprised of a mixture of commercial and residential buildings, surface and underground parking areas as well as parkland and amenity areas. The proposed development will be serviced by municipal water, sanitary and storm systems.

The preliminary servicing and stormwater management (SWM) plan for the site was presented in the *Functional Servicing and Preliminary SWM Report* (October 2, 2020), prepared by Tatham Engineering. Based on the preliminary SWM plan, several SWM facilities consisting of typical above ground controls

(wet or dry ponds) and subsurface systems (underground storage chambers) will provide the required water quantity controls for the site.

The following provides an assessment of potential LID controls which could be implemented within the site.

## **LID ASSESSMENT**

In accordance with City requirements, we have screened the site for potential LIDs utilizing the following guidelines:

- City of Barrie: Low Impact Development Interim Guidance (2019);
- City of Barrie: Infiltration Low Impact Development Screening Process; and
- CVC and TRCA: Low Impact Development Stormwater Management Planning and Design Guide (2011).

In general, the LID screening and design process follows the following steps:

Step 1: Define Targets

Step 2: Review Site Specific Information and Constraints

Step 3: Screen LIDs using Criteria and Guidelines

Step 4: Select Suitable Locations

Step 5: Complete Preliminary LID Design

Step 6: Proceed to Detailed Design if LID Targets are Achieved

This assessment summarizes our work completed to date, which consists of Steps 1 to 4 of the LID assessment process for the subject site. Steps 5 and 6 will be completed during the subsequent design stages of the project.

### **Step 1: Define Targets**

Based on our review and knowledge of City and NVCA design guidelines, we have established the following with respect to LID targets and requirements for the site:

1. NVCA supports and promotes the implementation of LIDs using best management practices as part of a treatment train approach;
2. NVCA requires the matching of post-development phosphorous loads to pre-development levels;
3. NVCA requires a water balance to be completed for development within HVA areas;
4. As per City engineering standards, all new developments greater than 5 ha shall provide post-to-pre infiltration (water balance) on-site where soils permit and unless otherwise established at the secondary plan stage; and



5. City requires best efforts be provided with respect to phosphorous loading.

It is noted that additional targets may be determined through consultation with the City and NVCA following their respective review of the material provided in support of the ZBA application.

### Step 2: Review Site Specific Information and Constraints

The following site-specific information and constraints with respect to LIDs have been determined:

- The site is located within a HVA, and, therefore, untreated runoff from paved surfaces will not be permitted.
- The site is located within a WHPAQ2, which is a water quantity protection zone. Therefore, groundwater recharge is to be maintained.
- The site is not located within a WHPA A through D, which are water quality zones. Therefore, WHPA A through D criteria do not apply.
- As per the *Hydrogeological Report: Proposed Residential and Commercial Development 664, 674 & 692 Essa Road & 320 Mapleview Drive West Barrie, Ontario* (October 1, 2020) prepared by Central Earth Engineering, the seasonally high groundwater table (GWT) elevations on the site range from 304.4 to 304.9, which vary between 3.9 m to 0.7 m below existing grade. As per typical LID design requirements, the base of any infiltration-based LID control is to be a minimum 1.0 m above seasonally high GWT.
- As per the *Geotechnical Report: Proposed Residential and Commercial Development 664, 674 & 692 Essa Road & 320 Mapleview Drive West Barrie, Ontario* (October 1, 2020) prepared by Central Earth Engineering, soils throughout the site consist mainly of glacial till underlain by layers of silt and clay. Infiltration rates of the native soils were not provided at this stage. Based on the required grading (filling) of the site, it is anticipated LIDs may not be constructed in native material, and, therefore, the infiltration rates and suitability of the native material with respect to infiltration is less critical.
- Based on the proposed site plan prepared by SVN, the site is highly impervious and includes large areas of underground parking. Therefore, there is limited open space to implement LIDs.
- The flood elevations within the re-aligned creek provide constraints with regards to the elevation/depth of storm outlets, which restrict the vertical clearance required for the implementation of LIDs.

The above noted constraints are to be considered throughout the next stages of the assessment process and will continue to be considered during the detailed design stage.

### Step 3: Screen LIDs using Criteria and Guidelines

In addition to the above constraints, we have used the City's *Infiltration Low Impact Development Screening Tool* to determine suitable infiltration controls for the site. As per Table 1.2 of the document, infiltration-based LIDs are permitted in mixed-use developments located within HVA areas, with



conditions. As the site is not located within a WHPA A or B, it is assumed that both infiltration and filtration controls would be permitted on-site, subject to review by City and NVCA staff.

Based on the constraints and criteria established above, the following LID controls were deemed to be feasible for the site, and have been selected for further review:

- Bioretention cells (filtration and/or infiltration);
- Enhanced grass swales;
- Vegetated filter strips;
- Infiltration trenches/chambers;
- Perforated storm sewers;
- Green Roofs; and
- Rainwater harvesting/re-use.

#### **Step 4: Select Suitable Locations**

As mentioned, the site plan provides limited opportunity for LIDs based on the high-density nature of the buildings and underground parking. However, the following LID controls/locations were determined to be feasible:

1. Where grading and servicing constraints allow, underground chamber SWM systems will be designed with an open base and a stone/void area to allow for infiltration of contributing runoff. The runoff will be pre-treated prior to entering this system via upstream controls (such as an OGS pre-treatment unit).
2. Where grading and servicing constraints allow, roof runoff from the proposed buildings can be directed to smaller infiltration or bioretention controls within each “block” (upstream of the larger downstream quantity control facilities). This runoff is generally considered to be clean and, therefore, is suitable for infiltration.
3. Perforated storm sewers can be provided in areas where the contributing runoff is clean (rooftops, open space areas etc.) or is pre-treated. Perforated storm sewers within the main roadways are not preferred, as it is difficult to provide quality control for runoff which is collected through a series of catch basins.
4. Vegetated filter strips and/or enhanced grass swales may be implemented within each development “block”, depending on the ultimate layout of the site plans.
5. The implementation of green roofs and rainwater harvesting will be further discussed with the architect as the plans for each building advance. However, it is noted the client has expressed interest in utilizing these features.



### Steps 5 and 6 (Next Steps)

The preliminary or detailed design of these LIDs has not yet been completed. However, based on our assessment of the site and our preliminary grading and servicing plans, we are confident the LIDs noted in Step 4 can be implemented to achieve the required design criteria, including water balance and phosphorous balance.

### SPILL CONTINGENCY PLAN

A spill contingency plan will be required for each infiltration-based LID control prior to construction. This spill contingency plan is typically included in the Operation and Maintenance Manual, often required to be submitted during the detailed design stage of subdivision/site plan projects. The spill contingency plans will be tailored to account for the specifics of each facility, including location and quality of contributing runoff (i.e. roof runoff, parking lot runoff, road runoff etc.). The spill contingency plan typically consists of the following:

- Relevant emergency contact numbers, including both owner and external/agency contacts;
- Descriptions of spill control equipment which should be kept on site, such as sorbent socks and mats and spill dikes;
- Description of action to be taken in the event of a spill, including procedures for responding, reporting and containment; and
- Action required to remedy contaminated LID, including flushing, pumping, cleanout and replacement of materials (if required).

### SUMMARY

We trust this Preliminary LID Assessment and Spill Contingency Plan is sufficient in support of the ZBA application for the proposed Maplevue Essa Development. As mentioned, additional information and details with respect to LIDs will be presented throughout the subsequent design stages for the project.

Yours truly,

**Tatham Engineering Limited**



Nick Millington, P.Eng.  
Senior Engineer, Project Manager  
NM:klc

