Council Report

Report Number:	**ENG2024-012**
Meeting Date:	May 21, 2024
Title:	**Southview Estate Drainage**
Description:	Drainage Review
Author and Title:	Juan Rojas, Director Engineering and Corporate Assets

Recommendation(s):

That Report ENG2024-012, **Southview Estates Drainage**, be received.

Department Head: _____

Financial/Legal/HR/Other:_____

Chief Administrative Officer:_____

Background:

At the Council Meeting of March 19, 2024, Council adopted the following resolution:

> **CR2024-123**
> **Moved By** Councillor Perry
> **Seconded By** Councillor Warren
>
> **That** Report ENG2024-006, **Drainage Near 149 Fenelon Drive**, be received; and
>
> **That** Staff be directed to review the requirements for an additional drain on the walkway in Southview Estates and report back to Council by the end of Q2, 2024.
>
> **Carried**

This report addresses that direction.

Report ENG2024-006, Drainage Near 149 Fenelon Drive can be found in Appendix A of this Report.

Rationale:

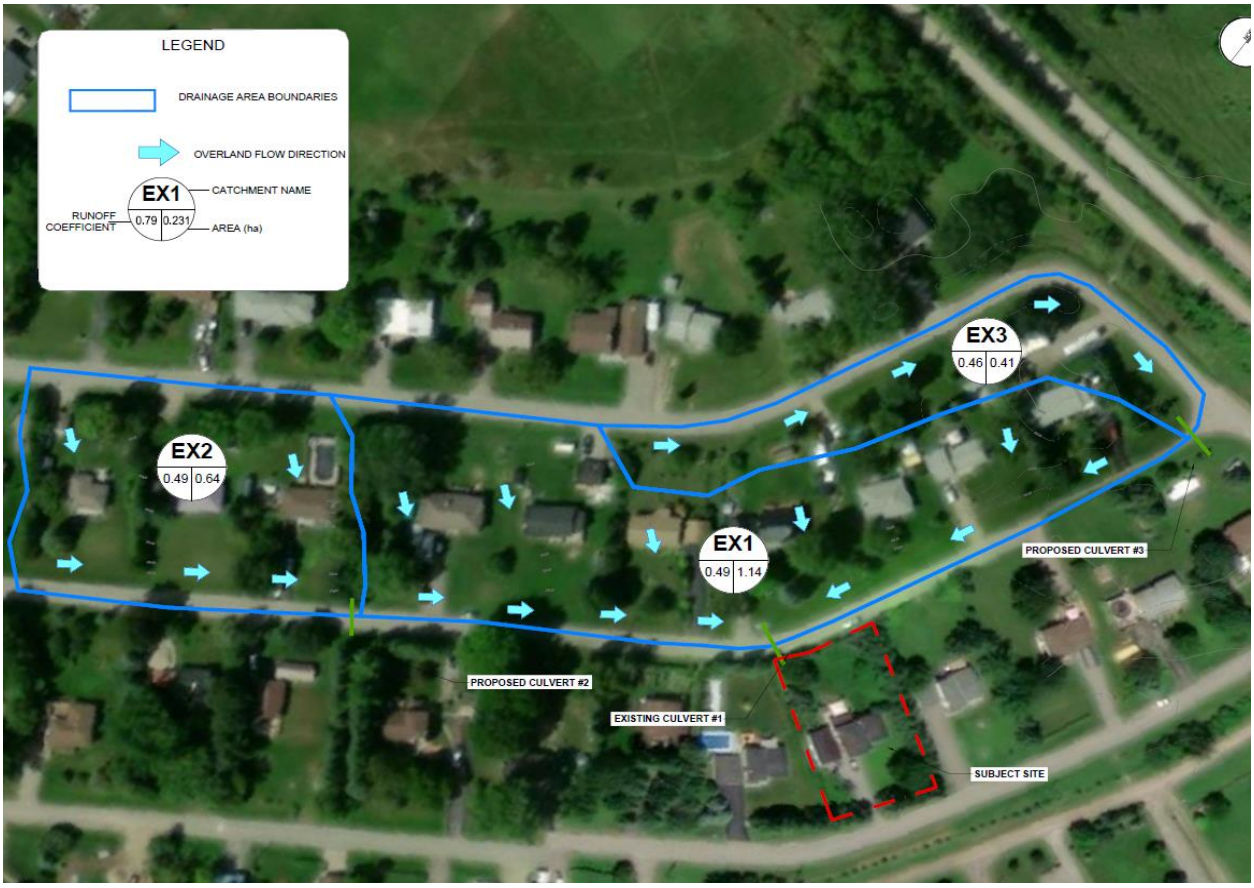
Engage Engineering Limited (Engage) has been retained to complete a review of the existing drainage patterns upstream of 149 Fenelon Drive in the City of Kawartha Lakes. The purpose of this review is to assess the upstream drainage area from 149 Fenelon Drive (the subject site) and explore possible interventions to limit flows passing through the swale on the south side of the property.

A complete copy of the Drainage Review Report can be found in Appendix B of this Report.

In Summary, approximately 2.19 ha of area currently flow to the existing culvert No. 1 located near 149 Fenelon Drive.

For this evaluation to determine a potential partial by-pass or diversion from existing culvert No 1, the existing drainage area was segmented into three areas in order to determine the flow rates that could be diverted.

The figure below shows the Drainage Area:



Proposed Culvert No 2 corresponds to installing a new culvert at the communal grass walkway and diverting a flow area of 0.64ha, (as per the homeowner of 149 Fenelon Drive request).

Proposed Culvert No 3 corresponds to installing a new culvert at the intersection of Cameron Drive and Fenelon Drive and diverting a flow area of 0.41ha.

The flow rate calculation is dependent on the storm intensity (i.e. the storm event), the following table calculates the flow in m^3/s with the corresponding catchment area and the specific rain event.

Peak Flow Summary (m^3/s):

Catchment	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
EX1	0.13	0.16	0.18	0.22	0.27	0.31
EX2	0.07	0.09	0.10	0.12	0.15	0.17
EX3	0.04	0.04	0.05	0.07	0.08	0.09
Total	**0.24**	**0.29**	**0.33**	**0.41**	**0.50**	**0.57**

By-Pass or Diversion Scenarios:

For design purposes, the 5-year storm event is utilized to evaluate the minor flow event, i.e. the most common storm event.

The following table calculates the percentage reduction of flow for the various scenarios:

Scenario Summaries – 5-Year Peak Flows

Scenario	Peak Flow Entering Site	Peak Flow Diverted	Percent Reduction
Do Nothing	0.29 (m^3/s)	0.00 (m^3/s)	0%
Proposed Culvert #2	0.20 (m^3/s)	0.09 (m^3/s)	31%
Proposed Culvert #3	0.25 (m^3/s)	0.04 (m^3/s)	13%
Both Culverts	0.16 (m^3/s)	0.13 (m^3/s)	44%

The majority of the Area, 1.14ha (66%) would still drain through the side yard of 149 Fenelon Drive, assuming two additional culverts are constructed.

The installation of two additional culverts would have additional maintenance requirements and would require downstream ditching.

As the existing drainage system is currently working as intended, the Do Nothing Scenario is recommended.

Possible mitigation measures for 149 Fenelon Drive:

1. The driveway of 149 Fenelon Drive has been widened towards the Drainage Ditch.

Current Driveway

Driveway prior to widening

With the larger driveway the area for snow storage has been reduced. During the winter months, it appears the snow is being shovelled downstream of the drainage ditch / culvert, thus possibly impeding the drainage.

A typical winter

Placing the driveway snow on the boulevard or lawn area would aid in ensuring that there is positive drainage and limit the erosion concerns.

2. Raising or relocating the garage propane tank adjacent to the Ditch.

The thaw and freeze

Summer Erosion after a typical rain storm

The pictures above were provided to Council by the owner of 149 Fenelon Drive at the March 5th, 2024 Committee of the Whole meeting.

The Propane tank is located beside the invert of the drainage ditch, during freeze thaw cycles, the ice is constrained by this pinch point of the drainage corridor. By relocating or raising the propane tank, it would reduce the potential erosion concerns.

In addition, the invert of the ditch could be reinforced with rip rap.

Other Alternatives Considered:

N/A

Alignment to Strategic Priorities

This report aligns with the below strategic priorities of the City:

1. Good Government

Financial/Operation Impacts:

The table below outlines the financial considerations for each scenario:

Option	Description	Preliminary Cost Estimate	Contingency	Total
Scenario 1	Do Nothing	$ 0.00	$ 0.00	$ 0.00
Scenario 2	Culvert # 2	$ 34,050.00	$ 6,810.00	$ 40,860.00
Scenario 3	Culvert # 3	$ 41,450.00	$ 8,290.00	$ 49,740.00
Scenario 4	Culvert 2 & 3	$ 75,500.00	$ 15,100.00	$ 90,600.00

Consultations:

Due to the quick turn around time requested by Council, consultation with the local homeowner's association was not undertaken.

Should council wish to proceed with utilizing the communal grass walkway (which is City owned) to divert flows (i.e. installing proposed culvert No 2), consultation with the homeowner's association would be recommended, as this would impact the existing pedestrian corridor and significantly impact and damage the roots of the mature spruce trees that flank the walkway.

Attachments:

Appendix A – ENG2024-006 – Drainage Near 149 Fenelon Drive

ENG2024-006
Drainage Near 149 Fe

Appendix B – Fenelon Drive Stormwater Management Brief

Stormwater
Management Brief.pd

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