

FUNCTIONAL SERVICE AND SWM REPORT

**PROPOSED RESIDENTIAL DEVELOPMENT
726 GORHAM ROAD
FORT ERIE, ON**

FEBRUARY 14 2022

PREPARED BY

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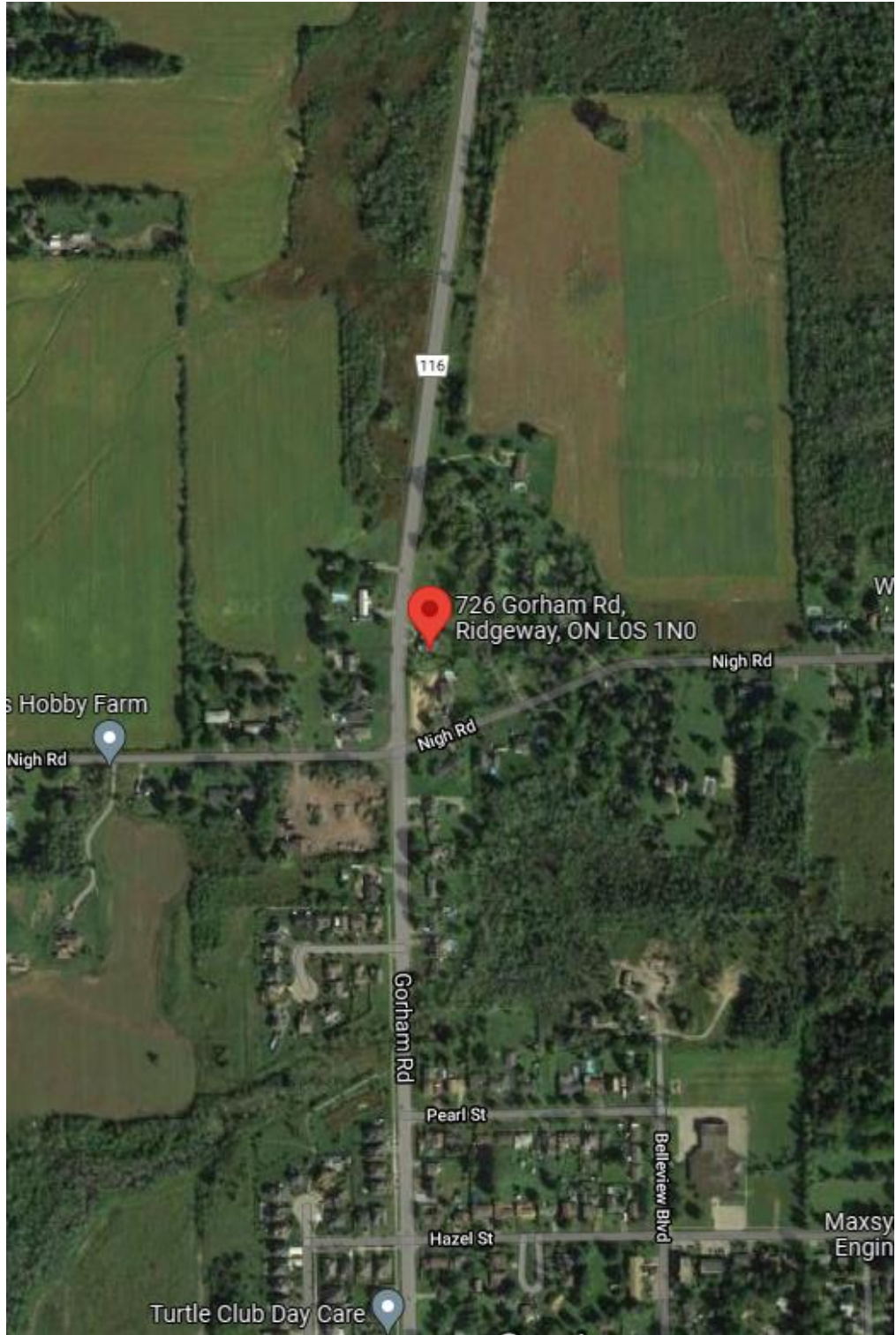
PROPOSED SEVERANCE 2045 HERATWOOD COURT MISSISSAUGA, ON

February 14, 2022

1.0 INTRODUCTION

Premier Engineering Solutions is retained to prepare a Functional Service and Stormwater Management Report to support the creation of seven new parcel of lands and one for the existing house for the subject address. The subject property is an approximately 0.68 hectare parcel of land, located east of Gorham Road and one block north of intersection of Gorham Road and Nigh Road. The subject property consists of a single-family residence. The satellite image of the site and its surrounding area is shown in **Figure 1** of this report.

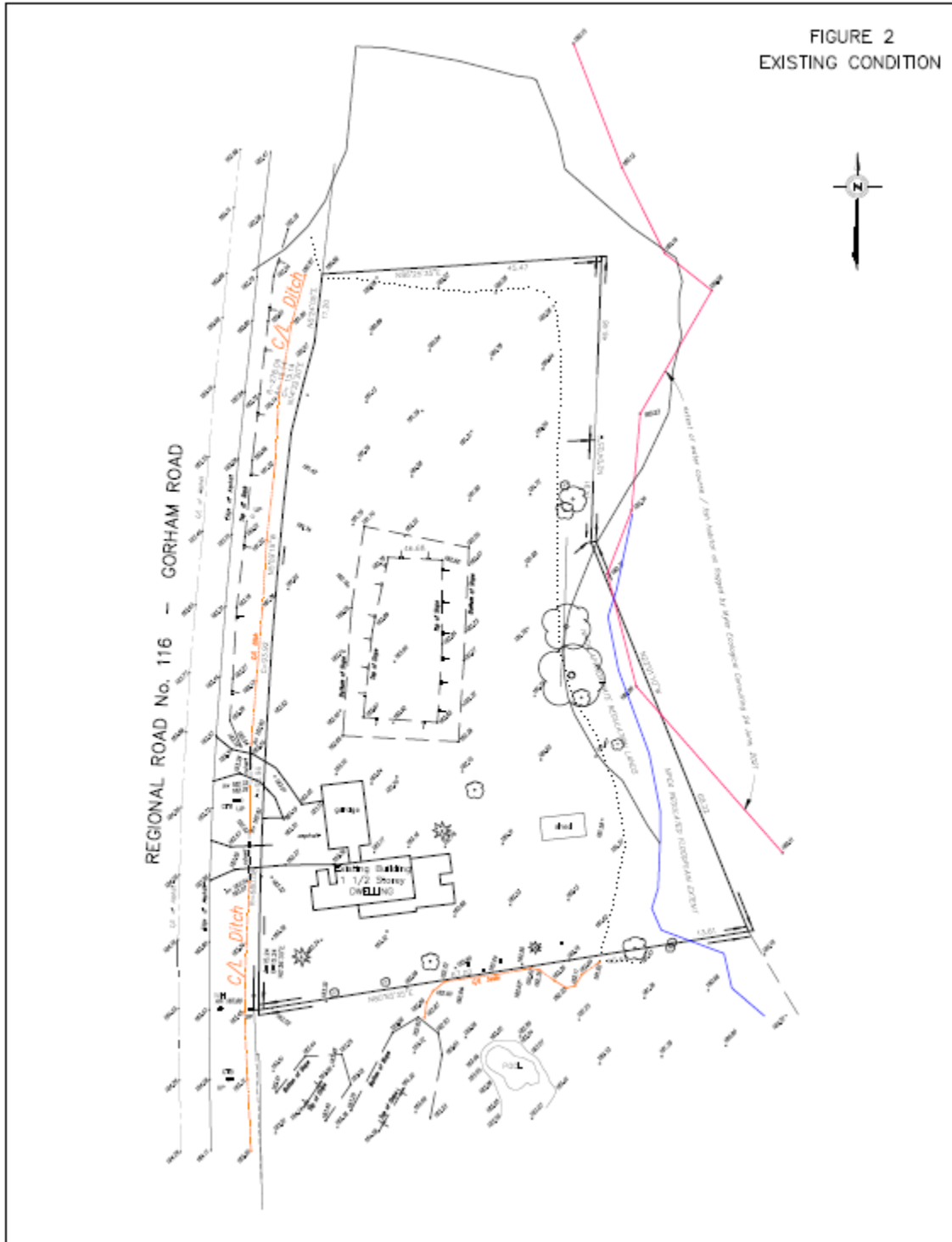
This report has been prepared to demonstrate the servicing feasibility of the proposed development is in conjunction with the existing municipal services available for the severed new lots and to see how the new development affects the existing municipal services and specially to see the how the drainage is affected by the proposed development.



**Figure 1 SATELLITE IMAGE OF THE SUBJECT SITE
AND IT'S SURROUNDING AREA**

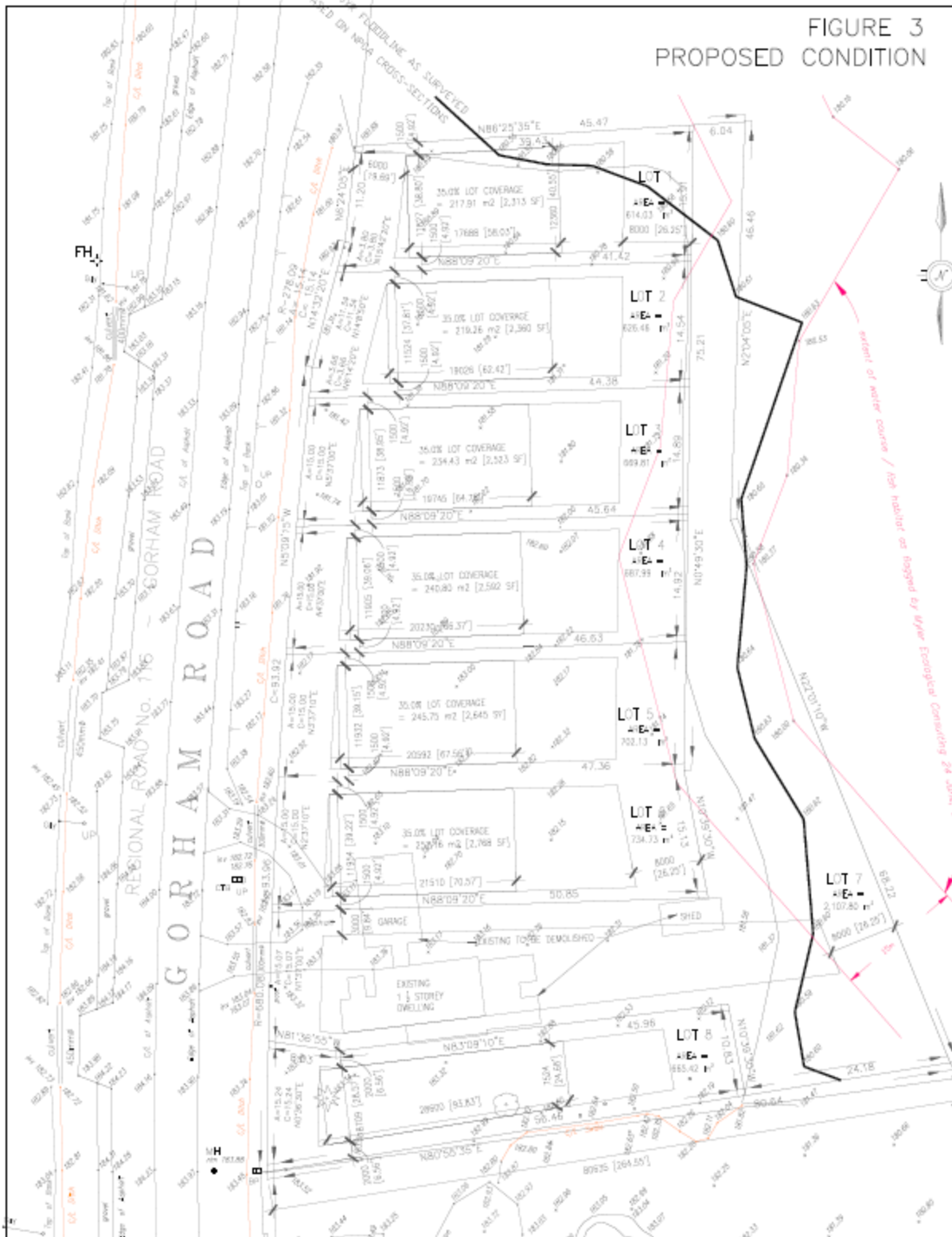
2.0 EXISTING CONDITION

There is an existing house on the lot with septic system. Remaining area is covered with grass and vegetation. The runoff discharged through sheet flow to the existing creek.



3.0 THE PROPOSED DEVELOPMENT

The proposed development consists of seven new single family houses in addition to the existing house which remain intact. A new sanitary sewer along Gorrham Road is being proposed for the proposed development.



2.0 WATER SYSTEM

2.1 EXISTING SYSTEM

There is an existing 150mm watermain across the Gorham Road. Two fire hydrant are located within the vicinity for the fire water requirement for the proposed development.

2.2 PROPOSED SYSTEM

We are proposing 20mm new domestic water connections for each proposed parcel of land from the existing 150mm along the street.

The Existing Fire Hydrants are less than 90m from the far end of the proposed development, we don't have any issue with the fire requirement.

3.0 SANITARY SYSTEM

3.1 EXISTING SYSTEM

There is no existing sanitary sewer available for the existing site. The existing single-family residence is served by a septic bed system. An existing sanitary sewer maintenance hole is located fronting the southwest corner of the property. One meter stud with a cap is available for the sanitary sewer extension along Gorham Road for the proposed development.

3.2 PROPOSED SYSTEM

We are proposing a new 200mm diameter sanitary sewer extension to connect all eight new parcel of lands. The existing septic tank and beds will be removed from the site.

4.0 FLOOD LINE AND 15M FISH HABITAT BUFFER LIMIT.

Some part of the northeast corner of Parcel 'A' is encroaching the 100Year Flood line. NPCA in their comments allowed 50m³ of fill in the encroachment area to move the 100-Year floodline. There will no construction within the 15m fish habitat buffer limit.

5.0 STORMWATER MANAGEMENT

5.1 PRE-DEVELOPMENT CONDITION (SINGLE LOT)

The new severed lot is a vacant grass land, with of dead trees remaining.

Area of Lot	=0.6807 ha
House	= 0.0249ha
Asphalt Pavement	=0.0113ha
Grass/Landscape	=0.6445 ha
Runoff Coefficient	$=(0.0249 \times 0.90 + 0.0113 \times 0.90 + 0.6445 \times 0.25) / 0.6807$ =0.29

5.2 EXISTING DRAINAGE PATTERN

There is no existing storm system. The drainage is sheet flow in the northeast direction, discharging towards the creek.

5.2 POST-DEVELOPMENT CONDITION

The existing lot is being proposed into eight parcel of lands.

	Parcel Area	Building. Area
Parcel 'A'	=0.0614ha	0.0248ha
Parcel 'B'	=0.0626ha	0.0248ha
Parcel 'C'	=0.0670a	0.0262ha
Parcel 'D'	=0.0688ha	0.0245ha
Parcel 'E'	=0.0702ha	0.0243ha
Parcel 'F'	=0.0735ha	0.0279ha
Parcel 'G'	=0.2107ha	0.0249ha
Parcel 'H'	=0.0665ha	0.0242ha
Total	=0.6807ha	0.2016

The front of the proposed houses will discharge to the existing ditch along the Street. The drainage from the roofs will be directed towards the creek through swales sloping in the east direction. The proposed swales will be first discharged to proposed raingardens located on the rear of the houses. In case of heavy rain, the proposed rain garden will overflow to the creek.

Asphalt Pavement Driveways	=6x8x8(average depth) =384m ² =0.0348ha
Total Hard surface	=0.2016+0.0348 =0.24 ha
Grass/Landscape Area	=0.6807-0.24 =0.4407ha
Runoff coefficient	=(0.24x0.90 + 0.4407x0.25)/0.6807 =0.48

5.3 QUANTITY CONTROL

As the property is adjacent to a creek and all the drainage is sheet flow, it is not possible to do Quantity control for the site. We have also looked into the infiltration option and found that this option is also not feasible as the soil is mostly clay with low permeability. Besides this, water table is also shallow.

5.3 WATER BALANCE MANAGEMENT

The primary objective of the water balance Targets/Criteria is to capture and manage annual rainfall on the development site itself to preserve the pre-development hydrology or “water balance”, which typically consists of three components: runoff, infiltration and through a combination of infiltration, evatranspiration, landscaping rainwater reuse or other low impact development practices. To achieve the minimum on-site retention requires proponent to retain all runoff from small design rainfall event-typically 5mm.

As per the Ministry of Environment, we can retain some runoff on the surface. The water table balance below shows the daily depth of rain retain over the site.

Rainwater to be retained at the Site	=6807x0.005 =34.04m ³
Rainwater Retained by Grass	=4407x0.005 =22.04m ³
Balance to be retained	=34.04-22.04 =12m ³

We are proposing raingarden at the rear of houses to retain this balance quantity of rainwater.

Average surface area of the proposed raingarden	=20m ²
Average depth	=0.10m

Rainwater stored in the proposed 8 raingardens = $8 \times 20 \times 0.10$
= 16m^3
Total volume of rainwater retained on the Site = $22.04 + 16$
= $38.04\text{m}^3 > 34.04\text{m}^3$ O.K.

6.0 GRADING

Site grading has been proposed such that there will be no adverse effect on the adjacent properties on the north and south. The drainage on the east and west is sheet flow and discharging to the existing ditch along the road and the creek on the west. The existing grades on the property lines are not disturbed.

5.0 CONCLUSION

With the proposed sanitary sewer extension for the site and the existing watermain along Gorham Road, and availability of the rainwater discharge through the creek, we don't find any problem to materialize the project for the proposed seven single family residence and one for the existing house without any obstacle. The proposed development will also generate impost fee for the City, which will assist in financing of other projects, in addition to the creation of healthy tax base.

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