BLANCHARD LETENDRE
ENGINEERING

# ADEQUACY OF SITE SERVICING REPORT

**Project Address –1274 Marygrove Circle**
**Ottawa, ON**

**Client:** **Oleksandr Patsukevych**

**By Blanchard Letendre Engineering Ltd.**
**Date – May 30, 2023**
**Our File Reference: 23-172**

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# 1. INTRODUCTION

Blanchard Letendre Engineering Ltd. (BLEL) was retained by Oleksandr Patsukevych to prepare a site servicing adequacy report for their proposed semi-detached building on the property located on 1274 Marygrove Circle in the City of Ottawa, Ontario.

This report will address the servicing (water, sanitary) requirements associated with the proposed development in response to the request of the City of Ottawa Planning department due to a rezoning application.

## 1.1. SITE DESCRIPTION

The existing site is located at 1274 Marygrove Circle, a short street ending with a cul-de-sac. The subject property measures a total area of approximately 0.05.ha.

Currently, the subject property features an existing single family home, which will be demolished and the proposed building will be constructed

## 1.2. PROPOSED DEVELOPMENT

The proposed development will be a 2-unit semi-detached building with a HIP roof and 2 regular garages, based on the site plan and conceptual floor plans by the owner's designer, Vince Catelli.

The site is fronting 225mm diameter concrete sanitary sewer, a 152mm diameter uncoated cast iron watermain and 300mm diameter concrete storm sewer on Marygrove Circle.

The site is proposed to be serviced from existing municipal water and sanitary services on Marygrove Circle Street.

# 2. WATER SUPPLY

### 2.1. Existing Residential Water Demand:

The water is distributed from the grid not far from the proposed development to Clyde Ave and runs from a feeder main on Maitland Ave, to Prom. Terrebonne Dr and finally to Marygrove circle.

The existing water demand is calculated based on the City of Ottawa Water Distribution Design Guidelines for an average house as follow:

- Residential occupancy = 3.4 persons per single family home unit (Table 4.1)

Total occupancy = 3.4 persons

- Residential Average Daily Demand = 350 L/c/d. (Table 4.2)
- Average daily demand of 350 L/c/day x 3.4 persons = 1190 Liters/day or 0.014 L/s.
- Maximum Daily Demand (factor of 2.5) is 0.014 L/s x 2.5 = 0.034 L/s
- Peak hourly demand (factor of 2.2) = 0.034 L/s x 2.2 = 0.076 L/s

### 2.2. Proposed Residential Water Demand

The water demand is calculated based on the City of Ottawa Water Distribution Design Guidelines as follow:

- Residential occupancy = 2.7 persons per semi-detached unit (Table 4.1)
- 2x unit x 2.7pers./unit = 5.4 persons

Total occupancy = 5.4 persons rounded up to 6 persons

- Residential Average Daily Demand = 350 L/c/d. (Table 4.2)
- Average daily demand of 350 L/c/day x 6 persons = 2100 Liters/day or 0.024 L/s.
- Maximum Daily Demand (factor of 2.5) is 0.024 L/s x 2.5 = 0.061 L/s
- Peak hourly demand (factor of 2.2) = 0.061 L/s x 2.2 = 0.13 L/s

The difference in maximum daily demand = 0.13 L/s -0.076 L/s = 0.054 L/s is negligible.

### 2.3. Fire Fighting Requirements:

Water demand for firefighting was calculated using both the OBC method and the 1999 FUS method, though the OBC method is proposed to govern the design. The proposed building is defined as two semi-detached units, with both units having a footprint of approximately 320 sqm each.

The OBC method for calculating flow for firefighting prescribes a fire flow requirement of 1800 L/m for buildings less than 600 sq.m.

The fire flow for one area was calculated as 1800L/m for each unit. A copy of the calculation can be found in Appendix A.

### 2.4. Water Boundary Conditions:

The above calculated residential water supply requirement and Fire Fighting Requirement were provided to the City of Ottawa for boundary conditions. The following are boundary conditions, (Provided by the City of Ottawa) HGL, for hydraulic analysis at 1274 Marygrove Circle assumed tobe connected to the 152 mm watermain on Marygrove Circle.

Minimum HGL = 126.7m
Maximum HGL = 133.0m
MaxDay + FireFlow (48 L/s) = 93.5m

The building is proposed to be serviced with two 19mm diameter HDPE water service (1 for each unit) connecting to the water main on Marygrove Circle. Using the Minimum HGL and the USF of the building =91.32m, the pressure we get in front of the building is approximately 50 psi. And using the Hazen Williams Equation:

$$h_f = \frac{10.67 \times Q^{1.85} \times L}{C^{1.85} \times d^{4.87}}$$

| Where: | |
|---|---|
| hf | Head loss over the length of pipe (m) |
| Q | Volumetric flow rate (m3/s) |
| L | Length of pipe (m) |
| C | Pipe roughness coefficient |
| d | Pipe diameter (m) |

The pressure loss as a result of servicing this development was determined to be 0.36psi, which is negligible.

### 2.5. Water Main Capacity

Fire hydrant flow and pressure tests were provided by the City of Ottawa for one hydrant. The Hydrant is located on the intersection of Marygrove Circle and Prom.Terrebone Dr. Available fire flow is at a pressure of 20psi with a flow of 48L/s (2880 L/m).

With a static pressure of 20psi, there is sufficient pressure to service this development.

A copy of fire hydrant flow can be found in Appendix B.

The available fire flow is 2880 L/min, which exceeds the required 1800L/min. A recalculation of the city's boundary conditions to determine the elevation head under MaxDay+FireFlow is recommended.

## 3. SANITARY SEWAGE

### 3.1. Existing Sanitary Sewage Calculation:

The existing sanitary sewer on Marygrove Circle discharges into the one in Prom. Terrebonne Dr. The existing sanitary sewer on Terrebonne Drive also receives effluent from Maitland Ave

Prom. Cameo and Greyrock Cres. The total upstream resident count has been estimated at 502 people with an average daily sewage generation of 2.04L/s.

An infiltration allowance of 0.28L/s/Ha has been considered. With an approximate area of 7.61ha, the extraneous flow will be 2.13L/s. The total average flow was calculated as 4.17L/s.

A peaking factor of PF=3.97 was calculated using the Harmon Equation. The peak flow is therefore 16.55 L/s.

### 3.2. Proposed Sanitary Sewage Calculation:

The design population will be the same as determined in the domestic water servicing section above. The design population of the building was determined to be 6 people.

The sanitary sewage flows were calculated in accordance with Chapter 5 of the MOE's 2008 Design Guidelines for Sewage Works. A per capita sewage flow of 350L/person/day was assumed. The total domestic sewage flow for 6 people is 0.024L/s. The peak factor, using the Harmon Formula, was found to be 4.5* use 4 maximum, for a peak sewage flow of approximately 0.1 L/s.

An extraneous flow allowance of 0.28 L/s/ha was assumed. With a site 0.05ha in size, the extraneous flow is 0.014 L/s, for a total design flow of 0.114L/s.

The total average daily demand for the site plus upstream domestic sewage generation is 2.05L/s and a population of 505 residents. The infiltration allowance remains 2.13L/s.

The peak factor is not affected. The proposed peak flow is therefore still 16.60m, after rounding up.

### 3.3. Domestic Sanitary Service:

This building is proposed to be served by two 135mm diameter PVC sanitary services (1 for each unit). With a slope of 2%, the sanitary service for each unit will have a capacity of approximately 19 L/s.

A copy of the sanitary flows can be found in Appendix C.

### 3.4. City Sanitary Sewer Capacity:

The existing sanitary sewer on Terrbonne Drive is a 300mm concrete pipe with a slope of 0.65% which has a capacity of 81.33 L/s as per appendix 6A of the city's sewer design guidelines. The proposed development will therefore have negligible impact on the city's sanitary sewers.

## 4. STORM SEWAGE

It is assumed that the site storm will be dealt with using lot level control. Therefore, there will be no impact on nearby storm sewers.

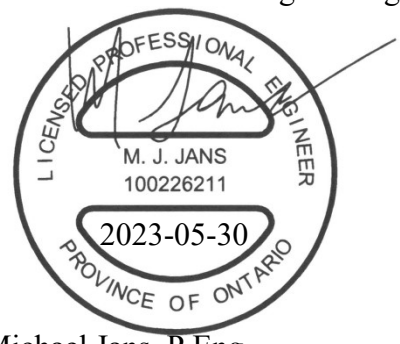
## CONCLUSION

1. There is an adequate water supply for domestic use and firefighting.
2. The existing water pressure is adequate for the proposed development.
3. Since it is estimated that the water pressure is less than 80 psi, pressure reducing valves are not required.
4. The proposed water service connection is adequately sized to serve the development.
5. The expected sanitary sewage flow will be adequately handled by the proposed sanitary sewer service connection.
6. The expected sanitary sewage flow will be adequately handled by the by the existing sanitary sewers on Marygrove Circle
7. The increase in sanitary flows contributing to the existing municipal sanitary sewer on Prom. Terrebonne is expected to have a negligible impact.

For any comment or clarification please contact the undersigned.
Should you have any question, do not hesitate to let us know.

Yours truly,

Blanchard Letendre Engineering Ltd.,




Michael Jans, P.Eng.

## APPENDIX A – FIRE FLOW CALCULATION

## APPENDIX B – BOUNDARY CONDITIONS

## APPENDIX C – SANITARY FLOW CALCULATION