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# JOHNSON

## ENGINEERING CONSULTANTS

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November 26, 2021

JEC File #20210089

The Municipality of Lambton Shores  
9575 Port Franks Road  
R.R.#1,  
Forest, ON  
N0M 2N0

Dear Nick Verhoeven, P Eng., Engineering Specialist

**Re: Renovations – 17 Pine St. Grand Bend ON Building Plumbing**

The existing single family house at 17 Pine St, Grand Bend is being proposed to be demolished and a new three storey, three unit condominium is being proposed. Initial consultation with the Township raised a concern that the sanitary system might not have capacity for the proposed use.

Following are the fixture units for the existing building (OBC Table 7.4.9.3):

- 1 bathroom groups (6x1=6): water closet, sink, tubs/shower
- 1 kitchen sink(1.5)
- Dishwasher (no load if connected to domestic sink)
- no clothes washer

Total fixture units= 7.5

The sewage flow rate for 7.5 fixture units would be approximately 21 imp gal/min (1.6 L/s) according to OBC Table 7.4.10.5.

Following are the fixture units for the proposed building (OBC Table 7.4.9.3):

Main Floor - 2 bathroom groups (6x2=12): 2 water closets, 2 sinks, 2 tubs/showers  
1 clothes washer (1.5)  
1 kitchen sink(1.5)  
Dishwasher (no load if connected to domestic sink)

Main floor total= 15

Second Floor - 3 bathroom groups (6x3=18): 3 water closets, 3 sinks, 3 tubs/showers:  
extra sink in bathroom doesn't count if both sinks share a trap  
1 clothes washer (1.5)  
1 kitchen sink (1.5)  
Dishwasher (no load if connected to domestic sink)

Second floor total= 21

Third Floor - 3 bathroom groups (6x3=18): 3 water closets, 3 sinks, 3 tubs/showers:  
extra sink in bathroom doesn't count if both sinks share a trap  
1 clothes washer (1.5)  
1 kitchen sink (1.5)  
Dishwasher (no load if connected to domestic sink)

Third floor total= 21

Total fixture units= 57



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The sewage flow rate for 57 fixture units would be approximately 44 imp gal/min (3.3 L/s) according to OBC Table 7.4.10.5.

**This suggests an increase in sanitary flow between the existing and proposed uses of 44-21 = 23 imp gal/min (1.7 L/s).**

A proposed horizontal drain on the site will have to be one of the following sizes and slopes would all be acceptable (OBC Table 7.4.10.8.)

- 4" drain with a slope of 1 in 100 (1.0%) is 180 fixture units
- 5" drain with a slope of 1 in 133 (0.75%) is 380 fixture units
- 6" drain with a slope of 1 in 133 (0.75%) is 600 fixture units
- 8" drain with a slope of 1 in 200 (0.5%) is 1400 fixture units
- 10" drain with a slope of 1 in 200 (0.5%) is 2500 fixture units
- 12" drain with a slope of 1 in 400 (0.25%) is 2240 fixture units
- 14" drain with a slope of 1 in 400 (0.25%) is 4800 fixture units

Alternatively, using a Municipal Engineers Association approach, the existing building would have an occupant load 2.4 persons. If each person has a design average daily flow rate of 450 L/capita/day, the design flow would be 1080 L/day (0.0125 L/s).

The proposed building would have an occupant load of about 26 persons (13 bedrooms). If each person has a design average daily flow rate of 450 L/capita/day, the design flow would be 2700 L/day (0.0313 L/s).

**Using this method, the increase in sanitary flow between the existing and proposed uses would be 2700-1080 = 1620 L/day (0.0188 L/s). Accounting for a peaking factor of 20 (the Babbitt peaking factor ranges from 10 to 17 for populations ranging from 2.4 to 26 persons), the increase in sanitary flow rate would be  $0.0188 \times 20 = 0.376$  L/s.**

Sincerely,



Brian Johnson, P. Eng.