384 Frank Street Ottawa Assessment of Adequacy of Public Services



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Table of Contents

1.	Intro	oduction	.2
2.	Pub	lic Services Capacity	.3
2	.1	Water Supply	. 3
2	.2	Sanitary Sewer	.4
2	.3	Site Stormwater Services	5
3. Conclusion and Recommendation			
3	.1	Water Supply	5
3	.2	Sanitary Sewer	5
3	.3	Stormwater	6

Appendix A: Calculations Appendix B: Correspondence

1. Introduction

The subject property is located at 384 Frank Street, Ottawa. The proposed work comprises of a 3-storey+basement apartment building. For the purpose of this report the site is considered to run north-south. Frank Street is extending west-east between Bank Street and O'Connor Street.

Currently the property is used as a residential lot with a single house which will be demolished. The rest of the lot is a parking (asphalt surface) with a grown tree on the south east corner of the property. Adjacent property on east side is also residential. Two properties, on south an west side are commercial buildings.

The area is serviced by municipal water (203 mm) and combined sewer pipe line (375 mm). Gas line (35 mm) is located along the north side of the street. A hydro duct is located under the sidewalk in front of the property and at elevation between 69.0-70.0 m a.s.l.



384 Frank Street, Ottawa: Location

2. Public Services Capacity

This section of the report will analyze existing municipal services and the potential impact of the proposed building at 384 Frank Street on the existing service capacity.

2.1 Water Supply

Existing building is supplied from 203 mm pipe and calculate consumption is 0.2 l/sec for the peak period.

Fire hydrant is located across the street at distance of 22.65 m, which is sufficient for use of this hydrant by fire department and its vehicles and provide fire protection of the site.

Design Parameter	Value		
Residential Average Apartment	1.8 P/unit		
Residential Average Daily Demand	280 L/d/P		
Residential Maximum Daily Demand	9.5 x Average Daily *		
Residential Maximum Hourly	1.5 x Maximum Daily *		
Commercial Demand	2.5 L / m2 /d		
Commercial Maximum Daily Demand	1.5 x Average Daily		
Commercial Maximum Hourly	1.8 x Maximum Daily		
Minimum Watermain Size	150mm diameter		
Minimum Depth of Cover	2.4m from top of watermain to finished grade		
During Peak Hourly Demand operating pressure must remain within	275kPa and 552kPa		
During fire flow operating pressure must not drop below	140kPa		
* Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.			

Table 1: Water Supply Design Criteria

¹The following are boundary conditions, HGL, for hydraulic analysis at 384 Frank (zone 1W) assumed to be connected to the 203 mm on Frank St (see attached PDF for location).

Minimum HGL = 106.9 m

¹ City of Ottawa boundary condition information is based on current operation of the city water distribution system (also see Appendix A for complete correspondence information)

Maximum HGL = 115.7 m

Max Day (0.35 L/s) + Fire Flow (30.86 L/s) = 103.3 m, the estimated ground elevation is 70.8 m.

The consumption is expected to be **32.39 I/min (0.54 L/sec)** for peak period. The fire flow for residential spaces was estimated to be 8000 I/min (133 I/sec)². The City staff confirmed the required flow availability. With fire hydrant at distance of 22.65 m and available fire flow, the proposed building will be sufficiently protected from fire.

Table 1 presents the City of Ottawa design criteria based on MOE Guidelines.

2.2 Sanitary Sewer

Sanitary sewer outflow for the current building is 0.06 l/sec. the lateral is connected to combined sewer 375 mm.

Design Parameter	Value		
Residential Average Apartment	1.8 P/unit		
Average Daily Demand	280 L/cap/day		
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0		
Correction Factor (City of Ottawa Tech.Bulletin ISTB-2018-01)	0.8		
Commercial Space	28,000 L/ha/day		
Infiltration and Inflow Allowance	0.33L/s/ha		
Sanitary sewers are to be sized employing the Manning's Equation	Q =(1/n)AR2/3S1/2		
Minimum Sewer Size	200mm diameter		
Minimum Manning's 'n'	0.013		
Minimum Depth of Cover	2.5m from crown of sewer to grade		
Minimum Full Flowing Velocity	0.6m/s		
Maximum Full Flowing Velocity	3.0m/s		
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, November 2012 & Infrastructure Technical Bulletins 2018			

 Table 2: Wastewater Design Criteria

² OBC SectionA.3.2.5.7, Table 2.

The estimated outflow for the new building is **0.15 l/sec** (peak flow + wet weather).

Existing municipal sewer 375 mm has a capacity of 12.29 l/sec for 0.546% slope and 20% full. For increase of 0.09 l/sec the increase will be only 0..75%. The capacity at 80% full is 137 l/sec.

Detailed calculation of pre and post development flow is presented in Appendix A.

2.3 Site Stormwater Services

Current building and the rest of surface of the lot at 384 Frank Street are impervious and all stormwater runoff is under uncontrolled condition.

The proposed new building and area of the lot are proposed to be impervious. This means that there will be no change in the runoff volumes nor it will be a need to store water on site.

3. Conclusion and Recommendation

3.1 Water Supply

The water supply demand calculation is based on the fire flow requirement for residential buildings; it is 8,000 l/min (133 l/sec). The City provided information that required flow is available at 103.3 m of HGL. The building roof is at elevation of 83 m which leaves 28.45 psi of residual pressure at maximum HGL of pressure.

3.2 Sanitary Sewer

The existing sanitary sewer 375 mm under 0.546% and 20% full is expected to provide a flow of 12.29 l/sec. Flow from the new building in rate of 0.15 l/sec for the peak wet weather flow will increase the pipe fulness for only 0.075%. The connection from the site will be by gravity (as presented on the plan).

3.3 Stormwater

Current and proposed watershed of the site are with the same factor of imperviousness. In addition, the current runoff is completely uncontrolled and it will be the same for the postdevelopment.

Currently all runoff is directed toward the street and catch basins. The proposed grading plan also directs all runoff toward the street. Therefore, it will be no increase of inflow from the site into the combined sewer pipe.

Based on the information provided by the City of Ottawa, the existing municipal services are adequate and will not be overloaded after the construction of the buildings at 384 Frank Street.

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Authorized by Professional Engineers of Ontario to provide professional services to public

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Appendix A: Calculations

Appendix B: Correspondence