ADEQUACEY OF PUBLIC SERVICING REPORT

3996 Innes Road, Ottawa

Prepared by

EAU Structural & Environmental Services

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Revision 0
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1 Project Description:

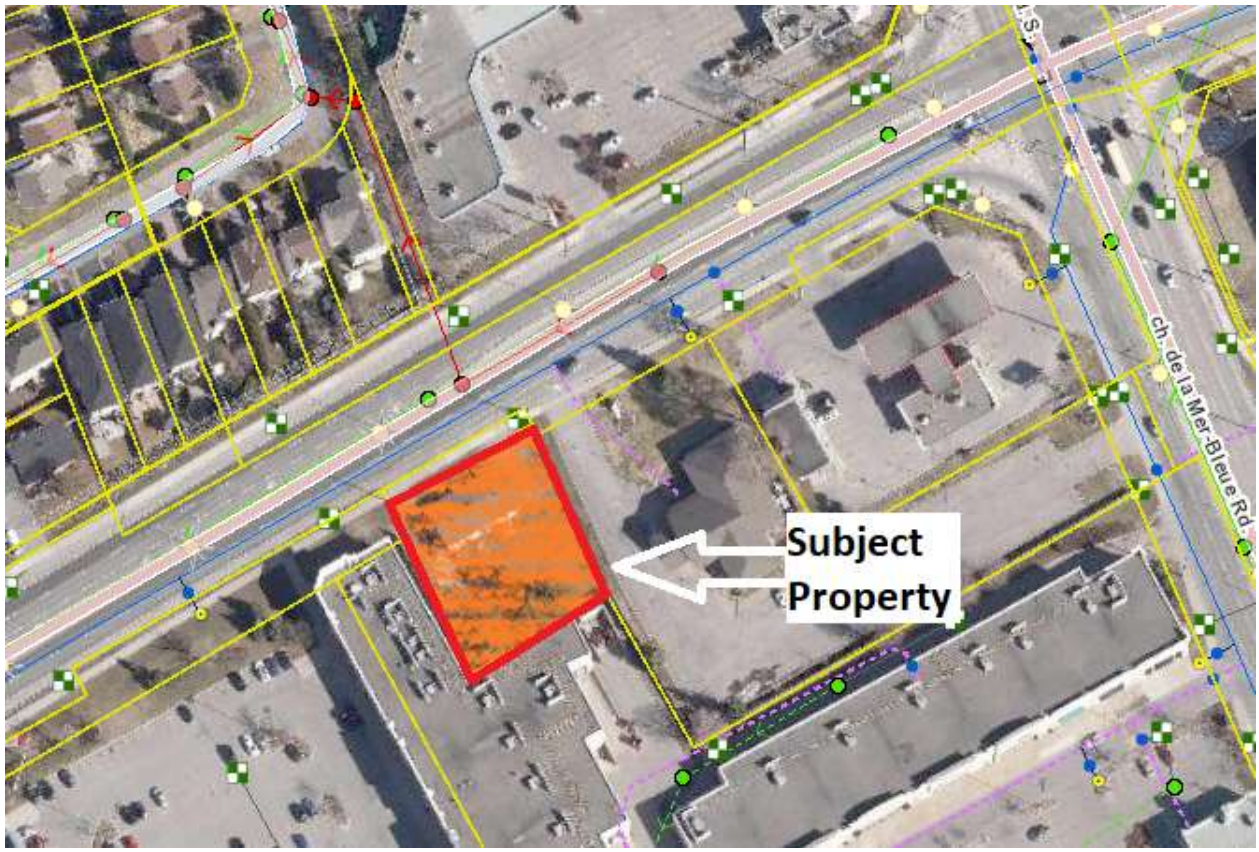
1.1. Introduction:

The property at 3996 Innes Road is located close to intersection of Mer Bleue Road and Innes Rd. The existing lot is 0.15 hectare, currently, contains a one story buildings built in circa 1970. It is proposed that the existing building to be demolished and a new 5-storey commercial/residential building be constructed. Property at 3996 Innes Road is currently zoned as AM (Arterial Mainstreet Zoning) which suits for the purpose of proposed development.

This report will address the servicing requirements associated with the proposed development located at 3996 Innes Road within the City of Ottawa. This report is prepared in response to the request from City of Ottawa Planning department.

1.2. Existing Conditions:

The property measures a total area of approximately 0.15 hectare. The site is fronting 610mm diameter DI water main, 250mm diameter PVC sanitary main and 600mm diameter concrete storm main.



1.3. Guidelines, Previous Studies, And Reports

The following studies were utilized in the preparation of this report:

- Ottawa Sewer Design Guidelines,
  City of Ottawa, SDG002, October 2012.
  (City Standards)
  - Technical Bulletin ISTB-2018-01
    City of Ottawa, March 21, 2018.
    (ISTB-2018-01)
  - Technical Bulletin ISTB-2018-04
    City of Ottawa, June 27, 2018.
    (ISTB-2018-04)

- Ottawa Design Guidelines Water Distribution
  City of Ottawa, July 2010.
  (Water Supply Guidelines)
  - Technical Bulletin ISD-2010-2
    City of Ottawa, December 15, 2010.
    (ISD-2010-2)
  - Technical Bulletin ISDTB-2014-02
    City of Ottawa, May 27, 2014.
    (ISDTB-2014-02)
  - Technical Bulletin ISTB-2018-02
    City of Ottawa, March 21, 2018.
    (ISTB-2018-02)

- Design Guidelines for Sewage Works,
  Ministry of the Environment, 2008.
  (MOE Design Guidelines)

- Stormwater Planning and Design Manual,
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- Ontario Building Code Compendium
  Ministry of Municipal Affairs and Housing Building Development Branch,
  January 1, 2012 Update. (OBC)

- Geotechnical Report
  Prepared by Paterson Group
  Report Number: PG5925-1
  Dated, November 17, 2021

1. Water Supply

Residential Water Demand:

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

Demand Type	Amount	Units
Commercial and Institutional		
- Shopping Centres	2500	L/(1000m^2/d)
- Hospitals	900	L/(bed/day)
- Schools	70	L/(Student/d)
- Trailer Parks no Hook-Ups	340	L/(space/d)
- Trailer Parks with Hook-Ups	800	L/(space/d)
- Campgrounds	225	L/(campsite/d)
- Mobile Home Parks	1000	L/(Space/d)
- Motels	150	L/(bed-space/d)
- Hotels	225	L/(bed-space/d)
- Tourist Commercial	28,000	L/gross ha/d
- Other Commercial	28,000	L/gross ha/d
Maximum Daily Demand		
Residential	2.5 x avg. day	L/c/d
Industrial	1.5 x avg. day	L/gross ha/d
Commercial	1.5 x avg. day	L/gross ha/d
Institutional	1.5 x avg. day	L/gross ha/d
Maximum Hour Demand		
Residential	2.2 x avg. day	L/c/d
Industrial	1.8 x avg. day	L/gross ha/d
Commercial	1.8 x avg. day	L/gross ha/d
Institutional	1.8 x avg. day	L/gross ha/d

- Residential occupancy :

1.4 persons per 18 bedroom apartment
2.1 persons per 2 bedroom apartment

 18 x 1.4 + 2 x 2.1 = 29.4

Total Residential Occupancy = 29.4 persons rounded up to 30 persons

Residential Average Daily Demand = 280 L/c/d.
 Average daily demand of 280 L/c/day x 30 persons =8400 Liters/day

- Commercial occupancy :

 28000 x 0.15 = 4200 L/d

Total Demand : 8400 + 4200 = 12,600 L/d or 0.15 L/s

- Maximum daily demand (factor of 2.5) is 0.15 L/s x 2.5 = 0.375 L/s
- Peak hourly demand (factor of 2.2) = 0.375 L/s x 2.2 = 0.825 L/s

Fire Fighting Requirement

Based on Fire Underwriter Survey Method

Fire flow protection requirements were calculated as per the Fire Underwriter's Survey (FUS).

Fire Flow Calculations as per Fire Underwriter's Survey Guidelines

$F=220C\sqrt{A}$

where

F= Required fire flow in L/min
C= Coefficient related to the type of construction
A= Total floor area in m²

Address:
File No.:

	Coefficient Related to Type of Construction		C-Value
C	• Wood Frame Construction	☐	1.5
	• Ordinary Construction	☑	1.0
	• Non-Combustible Construction	☐	0.8
	• Fire-Resistive Construction	☐	0.6
		C =	1.0

	Total Floor Area (m²)	
A	24200 ft² ◄►	2248.25 m²

	Required Fire Flow (L/min)	
F	= 220·C·√A	
	= 10431	L/min

Occupancy Reductions or Surcharges			
	• Non-Combustible	☐	-25%
	• Limited Combustible	☑	-15%
	• Combustible	☐	0%
	• Free Burning	☐	15%
	• Rapid Burning	☐	25%
			-15%
		8867	L/min

Sprinkler Reduction		
• Adequately Designed System	☑	-30%
• Water Supply is Standard	☐	-10%
• Fully Supervised System	☐	-10%
		-30%

	8867 L/min
Reduction:	2660 L/min
Fire Flow	6207 L/min

Exposure Surcharge			
Distance	Charge	# of Sides	
• 0 to 3m	25%		
• 3.1 to 10m	20%	1	20%
• 10.1 to 20m	15%		
• 20.1 to 30m	10%	1	10%
• 30.1 to 45m	5%	2	10%
			40%

	6207 L/min
Surcharge:	2483 L/min
Fire Flow:	8689 L/min

REQUIRED FIRE FLOW

Cannot exceed 45,000 L/min nor be less than 2,000 L/min

8689 L/min
or 145 L/s
or 1911 IGPM

Based on calculation, 145 L/S required duration 2.5 hours. In fact, any fire hydrant in the City of Ottawa has minimum of 150L/S capacity. Knowing the fact that the closest fire hydrant is 30m from the frontage property lines, we can assure that there is enough capacity for the proposed development. The boundary condition request is already been sent to the City official and waiting for the information to be received.

Due to the presence of the sprinkler, the size of water later is proposed to be 100mm diameter connecting to existing 610mm diameter DI water main on Innes road.

2. Sanitary Sewage

2.1. Sanitary Sewage Calculation

Design Flows

- Residential occupancy :

1.4 persons per 18 bedroom apartment
2.1 persons per 2 bedroom apartment

 18 x 1.4 + 2 x 2.1 = 29.4

Total Residential Occupancy = 29.4 persons rounded up to 30 persons

Residential Average Daily Demand = 280 L/c/d.
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- Commercial occupancy :

 28000 x 0.15 = 4200 L/d

Total: 8400 + 4200 = 12,600 L/d or 0.15 L/s

Peaking Factor = 1 + 14/(4 + (7/ 1000)^0.5) = 4.43 *use 4 maximum

Q Peak Domestic = 0.15 L/sec x 4.0 = 0.6 L/sec

Infiltration

Q Infiltration = 0.28 L/S/Gross hectare x 0.15 ha = 0.042 L/sec

Total Peak Sanitary Flow = 0.6 + 0.04 = 0.64 L/sec

The Ontario Building Code specifies minimum pipe size and maximum hydraulic loading for sanitary sewer pipe. OBC 7.4.10.8 (2) states "Horizontal sanitary drainage pipe shall be designed to carry no more than 65% of its full capacity." A 200mm diameter sanitary service with a minimum

slope of 1.0% has a capacity of 65.0 Litres per second. The maximum peak sanitary flows for the site is 0.64 L/s. Since 0.64 L/s is much less than 0.65 x65.0 = 42.3 L/s, therefore, 200mm diameter PVC pipe will be satisfactory.

Sewage discharges will be domestic in type and in compliance with the Ontario Building Code. The proposed service connection from the proposed building will be made to the existing sanitary sewer on Innes Road. The proposed service will be a 200mm diameter PVC pipe installed at a minimum slope of 1%.

The peak sanitary flow from the proposed development is less than 10 percent of the capacity of the existing sanitary. As such the proposed increase in sanitary flow as a result of the construction of the proposed building is negligible and there is sufficient available capacity for the proposed development.

Yours truly,
Derrick R. Clark, P. Eng.

APPENDIX A:

GeoOttawa Map


NORTH
ch. de la Mer-Bleue Rd
ch. de la Mer-Bleue Rd

APPENDIX C:

Drawings