



*A. J. Clarke and Associates Ltd.*

SURVEYORS • PLANNERS • ENGINEERS

## memorandum

**To:** City of Hamilton  
Growth Management Division  
Planning and Economic Development Department  
Development Engineering Section  
City Hall, 71 Main Street W., 6<sup>th</sup> Floor  
Hamilton, ON L8P 4Y5

*attn:* Michael Gojsic

**From:** Brad Clarke

**Date:** November 27, 2018

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**Re:** Wastewater and Water Usage Assessment  
804 – 816 King Street West, City of Hamilton

Dear Michael:

Below please find our estimated usage calculations based on the Ontario Building Code (OBC) and Fire Underwriters Survey for wastewater and water respectively.

### **1. Wastewater**

Using Table 8.2.1.3.A 'Residential Occupancy' of the Ontario Building Code, the wastewater calculations will be as follows:

Apartments, Condominiums, Other Multi-family Dwellings – per person = 275 volume, litres per day

From section 3.1.17.1 'Occupant Load Determination' clause (b), "two persons per sleeping room or sleeping area in a *dwelling unit or suite*",

8 three bedroom units = 48 people

22 four bedroom + den units = 176 people

= 224 persons

= 61,600 litres/day = **0.71 l/s**

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Stores – per water closet = 1,230 volume, litres per day

2 water closets = 2,460 litres/day = **0.03 l/s**

**Total = 0.74 l/s**

## 2. Water

The following is an estimate of the domestic peak water usage for the proposed development. Domestic peak demand for the site was calculated based on the “Fixture Unit Method” as per Table 7.6.3.2.A. forming part of sentences 7.6.3.1(1) to (3) and 7.6.3.4.(2), (3) and (5) of the 2012 Ontario Building Code. The number of fixtures per unit was estimated based on the floor plans provided by *Michael Spaziani Architect Inc.*

Component	No. of Units	Fixture Units/ Unit	Total Fixture Units/ Block
Bathroom Group with 6 LPF flush tank	60	3.6	216
Sink, kitchen, domestic, 8.3 L/min or less	30	1.4	42
Dishwasher, domestic	30	1.4	42
Lavatory, 8.3 L/min or less, <i>public use</i>	2	2	4
Water closet, 6 LPF or less with flush tank, <i>public use</i>	2	2.2	4.4
<b>Total Fixture Units for the Site</b>			<b>308.4 ≈ 309</b>

Total peak water usage for the site was derived from the fixture unit count as per Table 7.4.10.5 of the Ontario Building Code.

**309 FU's = 89.26 igpm (6.8 l/s)**

### **Fire Protection**

Fire flow calculations are provided as per Water Supply for Public Fire Protection, 1999, by the Fire Underwriters Survey. **Table 1**, attached, represents the required fire flow calculations for the proposed site. It can be seen that the proposed development would require **300 L/s** for fire protection on site.

A total flow of **306.8 l/s** would be expected for this site.



Two hydrants are located near the proposed development located at 802 King Street West and 10 Paradise Road North. Hydrant flow tests were performed by the City of Hamilton on July 30, 2015 and August 11, 2015 accordingly. These hydrant tests yielded theoretical flows available at 20 psi of 5516 igpm (418 l/s) and 3715 igpm (281 l/s) accordingly.

It can be seen that a connection to the King Street West watermain would provide sufficient flows to support this development.

I trust that you will find the above satisfactory for your purposes. If you have any questions or require any additional information regarding this matter, please do not hesitate to contact this office.

Yours very truly,



Brad Clarke, P.Eng.  
A. J. Clarke and Associates Ltd.



A. J. Clarke and Associates Ltd.

25 Main Street West Suite 300, Hamilton, ON L8P 1H1  
T: (905) 528-8761 F: (905) 528-2289

**FIRE UNDERWRITER SURVEY (FUS) CALCULATIONS FOR REQUIRED FIRE FLOW**

PROJECT: 804 - 816 King Street West  
JOB NO.: 188200  
DATE: November 20, 2018  
DATE PRINT: November 20, 2018  
DESIGN BY: BC

804 - 816 King Street West - Table 1						
SELECT COEFFICIENT "C"	COEFFICIENT RELATED TO TYPE OF CONSTRUCTION "C"					
	C	WOOD FRAME CONSTRUCTION	1.5	ORDINARY CONSTRUCTION	1	
		ORDINARY CONSTRUCTION	1			
		NON-COMBUSTABLE CONSTRUCTION	0.8			
FIRE RESISTIVE CONSTRUCTION (> 3 hrs)		0.6				
FLOOR AREA "A"	TOTAL FLOOR AREA EXCLUDING BASEMENTS "A"					
	A	SINGLE FAMILY	1	OTHER (COMM., INDUS., APART. ETC.)	1 UNIT(S)	
		TOWNHOUSE (INDICATE # OF UNITS)	8			
		OTHER (COMM., INDUS., APART. ETC.)	1			
	NO. OF FLOORS			6	6 STOREY(S)	
Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			910	5461 m2		
			Square Metres (m2)			
REQUIRED FIRE FLOW WITHOUT REDUCTION	F	REQUIRED FIRE FLOW AS PER FUS EQUATION ( $F = 220 * C * \sqrt{A}$ )				16,000 L/min *
BURNING FACTORS						
BUILDING COMBUSTIBILITY	HAZARD REDUCTION OR SURCHARGE	NON COMBUSTIBLE	-25%	LIMITED COMBUSTIBLE	-15%	13,600 L/min
		LIMITED COMBUSTIBLE	-15%			
		COMBUSTIBLE	0%			
		FREE BURNING	15%			
		RAPID BURNING	25%			
FIRE FLOW REDUCTION DUE TO PRESENCE OF SPRINKLERS	SPRINKLER REDUCTION	ADEQUATE SPRINKLER CONFORMS TO NFPA13	-30%	ADEQUATE SPRINKLER CONFORMS TO NFPA13	-30%	-4,080 L/min
		NONE	0%			
	STANDARD WATER SUPPLY CREDIT	WATER SUPPLY IS STANDARD FOR SPRINKLER AND FIRE DEPT. HOSE LINE	-10%	WATER SUPPLY IS NOT STANDARD OR N/A	0%	0 L/min
		WATER SUPPLY IS NOT STANDARD OR N/A	0%			
	SPRINKLER SUPERVISION CREDIT	SPRINKLER SYSTEM IS FULLY SUPERVISED	-10%	SPRINKLER NOT FULLY SUPERVISED OR N/A	0%	0 L/min
		SPRINKLER NOT FULLY SUPERVISED OR N/A	0%			
EXPOSURE DISTANCES	EXPOSURE DISTANCE BETWEEN UNITS	NORTH SIDE EXPOSURE	0 to 3.0m	65%	8,840 L/min	
		EAST SIDE EXPOSURE	3.1 to 10.0m			
		SOUTH SIDE EXPOSURE	20.1 to 30.1m			
		WEST SIDE EXPOSURE	20.1 to 30.1m			
REQUIRED FIRE FLOW	TOTAL REQUIRED FIRE FLOW (L/min)					18,000 L/min *
	TOTAL REQUIRED FIRE FLOW (L/s)					300 L/s

Notes: \*Rounded to nearest 1,000 L/min