Civelec Consultant Inc.

Project: KANATA BUILDINGS
O/Ref.: 2301-01A
Client: Rosefellow

FIRE FLOW ASSESSMENT

Applicable design guidelines:

1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 2020
2. Ottawa Design Guidelines - Water Distribution (2010) ISTB-2018-02
3. Technical Bulletin ISTB-2021-03

STEP A - Determine the type of construction

Type of construction	Coefficient (C)	Value selected (C)
Fire-resistive construction (> 3 hours)	0.6	**1.0**
Non-combustible construction	0.8	
Ordinary construction	1.0	
Wood frame construction	1.5	

STEP B - Determine the floor area

Floor / Level	Floor area per level (sq. ft.)	Floor area per level (m^2)
Gross floor area (GFA) ground level	248,581	23094
Total floor area (A)	**248,581**	**23094**

STEP C - Determine the height in storeys

Floor / Level	Number of storeys	Percent of floor area considered
Ground level	3	100%
Height in storeys	**3**	

STEP D - Determine base fire flow *(round to nearest 1,000 L/min)*

$$F = 220C\sqrt{A}$$

Where:

F is the required fire flow in L/min

C is the coefficient related to the type of construction, and;

A is the total floor area of the building in m^2

Coefficient related to type of construction (C) = **1.0**

Floor area considered (A) = **69282** m2

REQUIRED (BASE) FIRE FLOW (F) = **58,000** **L/min** (*rounded to nearest 1,000 L/min)*

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STEP E = Determine the increase or decrease for occupancy and apply to Step D *(Step D x Step E, do not round)*

Occupancy Class	Occupancy factor	Value selected (C)
Non-combustible	0.75	**1.0**
Limited combustible	0.85	
Combustible	1.00	
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) = **57,907** **L/min** *(not rounded)*

STEP F - Determine the decrease, if any, for automatic sprinkler protection and apply to value in Step D above *(do not round)*

Sprinkler system design	Sprinkler design charge	Value selected (C)	Total charge
Automatic sprinkler system conforming to NFPA standards	-30%	Yes	-30%
Standard water supply	-10%	Yes	-10%
Fully supervised system	-10%	Yes	-10%
Additional reduction - adjacent buildings sprinklerd	-25%	Yes	-25%
Total charge for sprinkler system			**-75%**

DECREASE FOR SPRINKLER PROTECTION = **14,477** **L/min** *(not rounded)*

STEP G - Determine the total increase for exposures and apply to value in Step D above *(do not round)*

Façade	Separation distance (m)	Length-height factor of exposed wall (m-storeys)	Assumed construction of exposed wall of adjacent	Total change (%)
North façade	> 30	N/A	N/A	0%
East façade (fire/party wall)	> 30	N/A	N/A	0%
South façade	> 30	N/A	N/A	0%
West façade	> 30	N/A	N/A	0%
Total charge for exposures				**0%**

INCREASE FOR EXPOSURES = **0** **L/min** *(not rounded)*

STEP H - Determine fire flow including all increases and reductions (Step E + Step F + Step G, *round to nearest 1,000 L/min*)

TOTAL REQUIRED FIRE FLOW (RFF) = **14,000** **L/min** ***(rounded to nearest 1,000 L/min)***
233 **L/s**
3698 **USGPM**

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STEP I - Additional adjustemnt for engineering judgement. Justification: Reduction for ESFR sprinkler: 25%

TOTAL REQUIRED FIRE FLOW (RFF) =	**11,000**	**L/min** ***(rounded to nearest 1,000 L/min)***
	183	**L/s**
	2906	**USGPM**

Prepared by: Paul Lhotsky Date: March 24 2023