

**EXISTING THREE-STOREY
RESIDENTIAL CONVERSION TO EMBASSY BUILDING**

**168 DALY AVENUE
CITY OF OTTAWA**

**SITE POTABLE WATER
SERVICING BRIEF**

T. L. MAK ENGINEERING CONSULTANTS LTD.

SEPTEMBER 2017

REF. FILE No. 817-18

1.) INTRODUCTION

The applicant (Embassy of the Republic of Estonia) is proposing to rezone the existing property to permit office use limited to an embassy. Presently, on site is a three-storey residential building at 168 Daly Avenue. Application to the City of Ottawa for rezoning is being made for further development of this site.

The said property is located on the south side of Daly Avenue and situated west of Nelson Street and east of King Edward Avenue.

The existing building is three storeys above ground with a basement level. It is our understanding from the applicant's representatives that some minor renovations will be carried out in the building with no additional increase in fixture units. Most of the renovation activities will be confined to the basement level.

From the City of Ottawa Engineering Department's recent review comments, one of the requirements to complete this application is a potable water servicing brief for providing the fire flow water demands for the site.

T.L. Mak Engineering Consultants Ltd. has been retained to prepare a "Potable Water Servicing Brief" for this site as a supplement to the rezoning application.

2.) EXISTING SITE CONDITIONS AND SERVICING

Currently on site is an existing residential three-storey building that fronts on Daly Avenue. East of the building is an existing asphalt driveway available for vehicle access and parking.

There are four (4) bedrooms in the building with three (3) full bathrooms and a powder room. The building is proposed for conversion to office use only for an embassy.

3.) POTABLE WATER

From recent discussions with the applicant's representatives, they confirmed that the existing three-storey building does not have a sprinkler system. Our analysis will be based on a non-sprinklered building.

As requested by the City of Ottawa, we conducted a potable water servicing hydraulic assessment for an existing building located at 168 Daly Avenue. The property is located within the City of Ottawa's Zone 1W Pressure Zone. The existing 3-storey single family residence is proposed to be converted to an embassy, used primarily for office space. The basement is greater than 50% below grade. The first floor has a square footage of approximately 160 m² whereas the 2nd and 3rd floors are approximately 97 m² each. The building is wood frame, the contents are considered to be limited combustibility and there is no sprinkler system. Separation distances are per the attached Fire Underwriter's Survey (FUS) calculation sheet. Demands are conservatively

estimated using single family home design flows. The following are the estimated domestic demands and required FUS fire flows:

BSDY: 0.014 L/s

MXDY: 0.034 L/s

PKHR: 0.076 L/s

Fire flow: 9000 L/min or 150 L/s.

The boundary conditions for the site, provided by the City on September 21, 2017, are as follows:

Minimum HGL = 106.7 m

Maximum HGL = 115.7 m

Max Day (0.034 L/s) + Fire Flow (150 L/s) = 104.2 m

Based on a ground elevation of approximately 69.3 m, the resulting pressures are as follows:

Minimum = 365 kPa (53 psi)

Maximum = 455 kPa (66 psi)

Max Day + Fire = 345 kPa (50 psi)

The resulting minimum and maximum pressures are within the City's 2010 Potable Water Design Guideline objective pressure range of 276 kPa (40 psi) to 552 kPa (80 psi) for average day and peak demands for typical one and two storey buildings. This building, however, is a 3-storey building. Minimum pressures for a 3-storey building are recommended to be an additional 35 kPa (5 psi) higher to account for the elevation difference and additional pipe head loss. As such, minimum pressures of at least 310 kPa (45 psi) are recommended for three-storey buildings. The minimum pressures reported in the boundary conditions are higher than 310 kPa (45 psi) and therefore considered to be adequate.

Maximum pressures do not exceed 552 kPa (80 psi) and therefore do not require a pressure reducing valve as per the Ontario Plumbing Code. As this is measured at ground elevation, the conclusion is the same for buildings with one, two, three or more storeys.

The resultant maximum day demand plus fire flow pressure of 345 kPa (50 psi) is significantly higher than the minimum required pressure of 140 kPa (20 psi) and is therefore considered to be adequately protected based on FUS requirements.

In conclusion, based on the boundary conditions provided, the 203 mm diameter watermain on Daly Avenue and the nearby hydrant provide adequate fire flow capacity as per the Fire Underwriters Survey calculated fire flow requirement and provide anticipated demand flows at acceptable pressures during normal operating conditions per the City of Ottawa Water Design Guidelines.

PREPARED BY T. L. MAK ENGINEERING CONSULTANTS LTD.

TONY L. MAK, P. ENG.

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**168 DALY AVENUE
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APPENDIX A

**CITY OF OTTAWA
WATER DATA
BOUNDARY CONDITIONS
AND
FUS FIRE FLOW CALCULATIONS**

From: [Wu, John](#)
To: [TL Mak ;](#)
Subject: RE: 168 Daly Avenue
Date: Thursday, September 21, 2017 1:47:22 PM
Attachments: [168 Daly Sept 2017.pdf](#)

Here it is:

The following are boundary conditions, HGL, for hydraulic analysis at 168 Daly Ave (zone 1W) assumed to be connected to the 203 mm on Daly Ave. (see attached PDF for location).

Minimum HGL = 106.7 m

Maximum HGL = 115.7 m

Max Day (0.034 L/s) + Fire Flow (150 L/s) = 104.2 m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

John

From: TL Mak [mailto:tlmakecl@bellnet.ca]
Sent: Tuesday, September 19, 2017 9:48 AM
To: Wu, John <John.Wu@ottawa.ca>
Subject: 168 Daly Avenue

Hi John,

The following is the information provided regarding our request for a boundary condition for 168 Daly Avenue in the City of Ottawa.

The existing 3-storey single family residence is being converted to an Embassy. The basement is greater than 50% below grade. The first floor has a square footage of approximately 160m² whereas the 2nd and 3rd floors are approximately 97m² each. The building is wood frame, the contents are considered to be limited combustibility and there is no sprinkler system. Separation distances are per the attached FUS calculation sheet. Demands are conservatively estimated using single family home design flows. The following are the domestic and fire flow values to be used in the request for boundary conditions:

BSDY: 0.014 L/s

MXDY: 0.034 L/s

PKHR: 0.076 L/s

Fire flow: 9000 L/min or 150 L/s

The City is requested to provide boundary conditions for the Average Day, Maximum Day, Peak Hour and Fire Flow conditions indicated above.

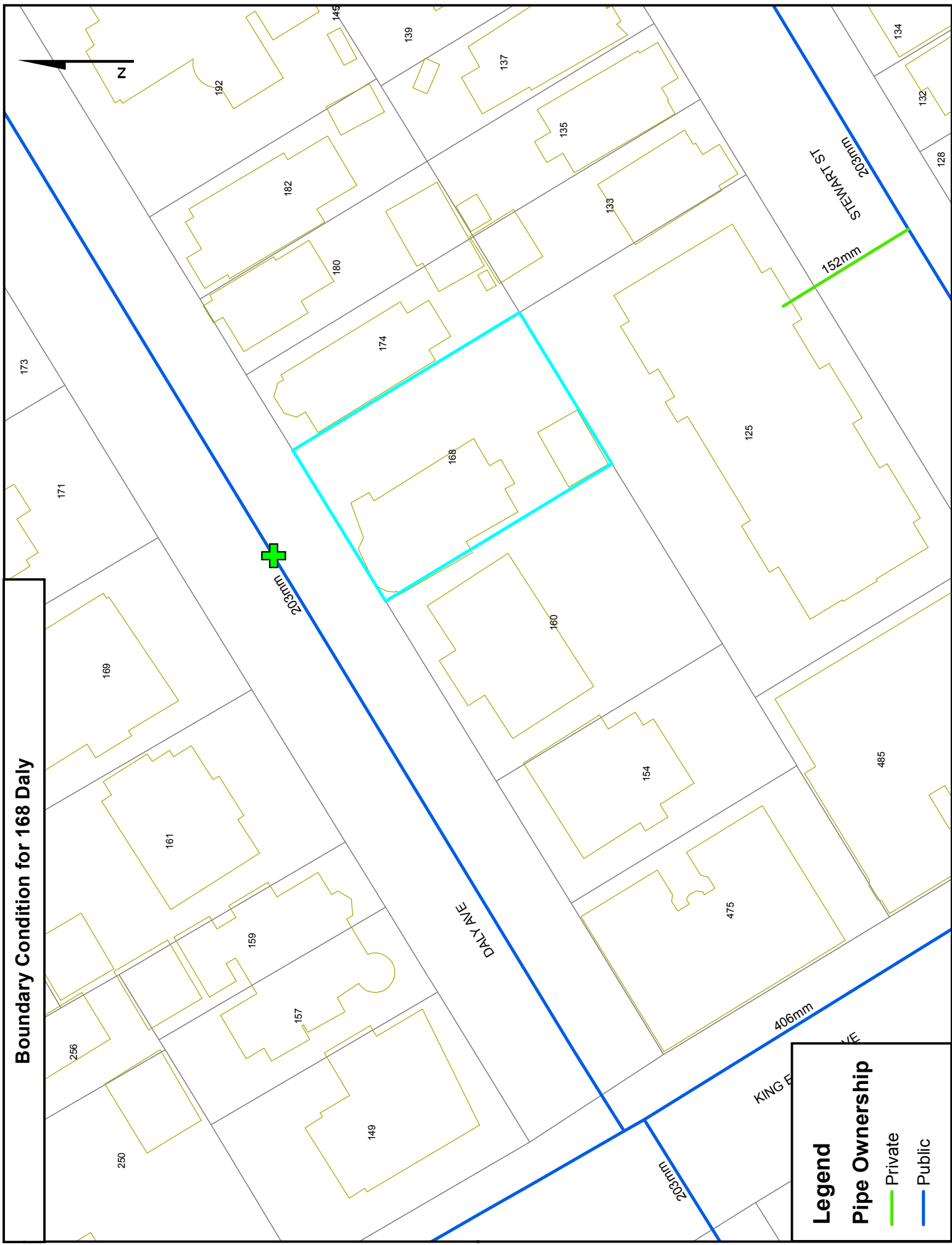
Thank you for your prompt attention to this matter. Please forward the boundary conditions as soon as possible.

Tony Mak
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Boundary Condition for 168 Daly



Legend

Pipe Ownership

- Private (green line)
- Public (blue line)



FUS Fire Flow Calculations

Calculations Based on 1999 Publication "Water Supply for Public Fire Protection" by Fire Underwriters' Survey (FUS)

Stantec Project #: 163401084
 Project Name: 168 Daly Ave
 Date: September 18, 2017

Fire Flow Calculation #: 1
 Building Type/Description/Name: Embassy

Data input by: Kevin Alemany, M.A.Sc., P.Eng

Notes:

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method									
Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)	
1	Choose Frame Used for Construction of Unit	Framing Material							
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m		
			Ordinary construction	1					
			Non-combustible construction	0.8					
			Fire resistive construction (< 2 hrs)	0.7					
Fire resistive construction (> 2 hrs)	0.6								
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Floor Space Area							
		Type of Housing	Single Family	1	Single Family	1	Units		
			Townhouse - indicate # of units	3					
	Other (Comm, Ind, etc.)	1							
2.2	# of Storeys	Number of Floors/ Storeys in the Unit (do not include basement):			3	3	Storeys		
3	Enter Ground Floor Area of One Unit	Enter Ground Floor Area (A) of One Unit Only :			160m2 (Ground), 97m2 (2nd and 3rd)		354	Area in Square Meters (m ²)	
		Measurement Units	Square Feet (ft ²)	0.09290304	Square Metres (m ²)				
			Square Metres (m ²)	1					
			Hectares (ha)	10000					
4	Obtain Required Fire Flow without Reductions	Required Fire Flow(without reductions or increases per FUS) ($F = 220 * C * \sqrt{A}$) Round to nearest 1000L/min						6,000	
5	Apply Factors Affecting Burning	Reductions/Increases Due to Factors Affecting Burning							
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	5,100	
			Limited combustible	-0.15					
			Combustible	0					
			Free burning	0.15					
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Complete Automatic Sprinkler Protection	-0.3	None	0	N/A	0	
			None	0					
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	20.1 to 30.1m	0.1	0.75	m	3,825	
			East Side	3.1 to 10.0m	0.2				
			South Side	3.1 to 10.0m	0.2				
			West Side	0 to 3.0m	0.25				
6	Obtain Required Fire Flow, Duration & Volume	Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:						9,000	
		Total Required Fire Flow (above) in L/s:						150	
		Required Duration of Fire Flow (hrs)						1.75	
		Required Volume of Fire Flow (m³)						945	

Note: The most current FUS document should be referenced before design to ensure that the above figures are consistent with the intent of the Guideline

Legend	
	Drop down menu - choose option, or enter value.
	No Information, No input required.