NOVATECH
Engineers, Planners & Landscape Architects

T E C H N I C A L M E M O R A N D U M

DATE: **JUNE 17, 2019**

TO: **MURRAY CHOWN**

FROM: **CARA RUDDLE**

RE: **300-306 ELMGROVE AVENEUE – SITE SERVICING BRIEF**

Novatech has been retained to review the Adequacy of Existing Services for the Zoning By-law Amendment and the Site Plan application of the four properties at 300-306 Elmgrove Avenue in the City of Ottawa. Refer to **Figure 1** – Key plan for the site location. The construction of four triplex buildings is currently underway on the subject properties. The triplex buildings were originally designed to have three two-bedroom units. The current proposal is to establish a fourth two-bedroom unit in the basement of the triplex. This would convert the use of the buildings from a triplex to a four-unit low rise apartment building. Refer to **Figure 2** for the proposed Site Plan.

The purpose of this technical memorandum is to review the water, sanitary and storm servicing requirements for the proposed additional units. The memo will provide an analysis of the existing infrastructure surrounding the site to ensure there is adequate capacity for the additional units.

WATER SERVICING

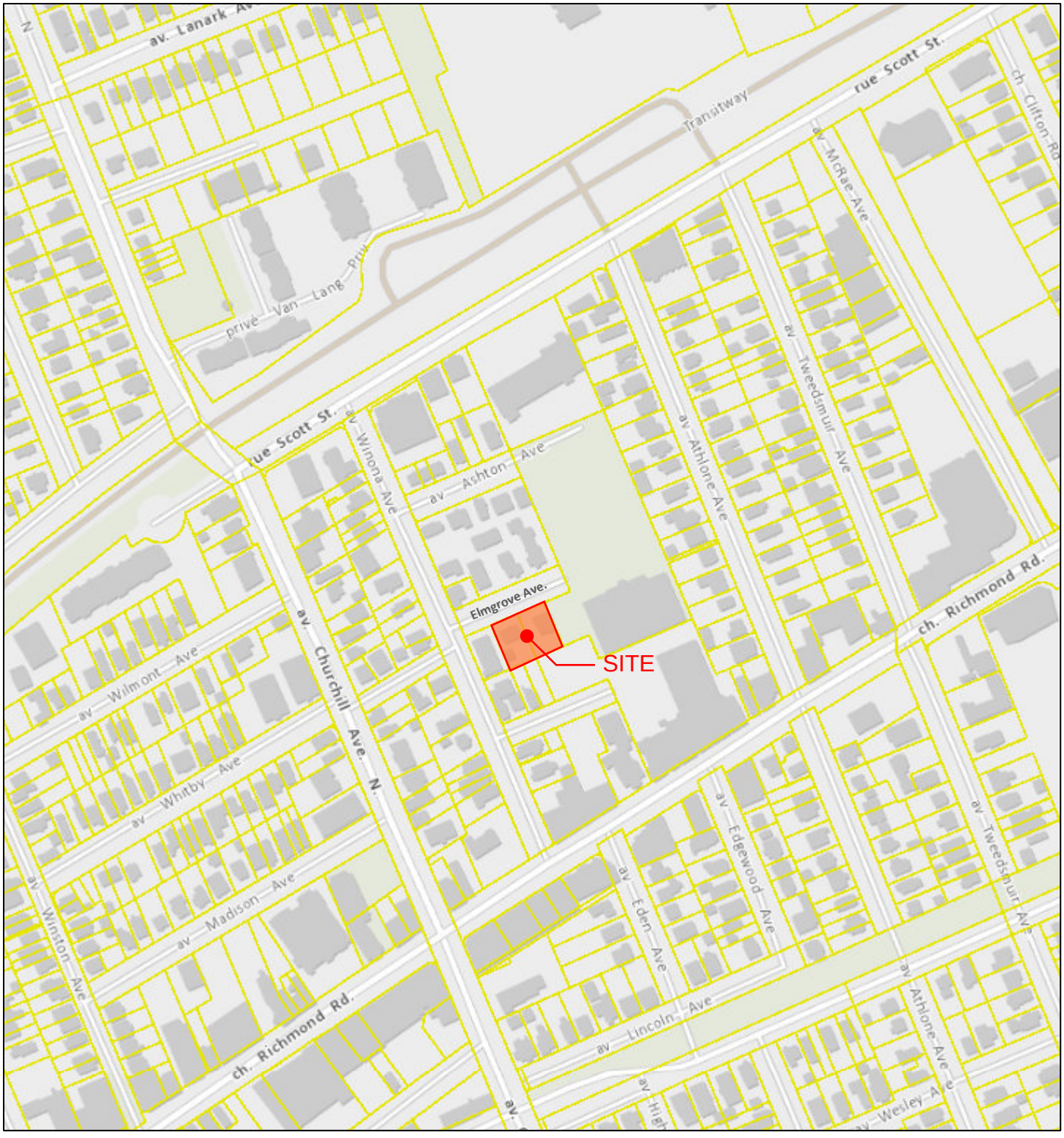
There is an existing 152mm diameter watermain in Elmgrove Avenue that currently services the subject site. Refer to **Figure 3** for details on the existing servicing information**.** The domestic water demands for the proposed 4-unit apartment buildings were calculated and provided to the City of Ottawa to obtain boundary conditions to confirm serviceability. The domestic water demand calculations are based on a theoretical population for the proposed apartment units based on criteria provided in the City of Ottawa Water Design Guidelines. The water demand calculations, boundary conditions and watermain analysis calculations for the existing public infrastructure are provided in **Appendix A.** The results of the hydraulic analysis are summarized below in **Table 1**.

Table1: Water Analysis Results Summary

Condition	Water Demand	Min/Max Allowable Operating Pressures	Limits of Design Operating Pressures
High Pressure	0.14 L/s	80 psi (Max)	72.6 psi
Peak Hour	0.75 L/s	40 psi (Min)	63.8 psi

The required fire flow was calculated to be 8,000 L/min using the Fire Underwriter's Survey (FUS) method and is based on 3-storey above ground wood frame construction. Refer to **Appendix A** for a copy of the FUS fire flow calculations. There are three existing fire hydrants within the vicinity of the proposed development which will provide fire protection, one on Elmgrove Avenue and two on Winona Ave. Refer to **Figure 3** for the existing hydrant locations. Boundary conditions were

Figure 1 Keyplan



April 26, 2019

1:5,000

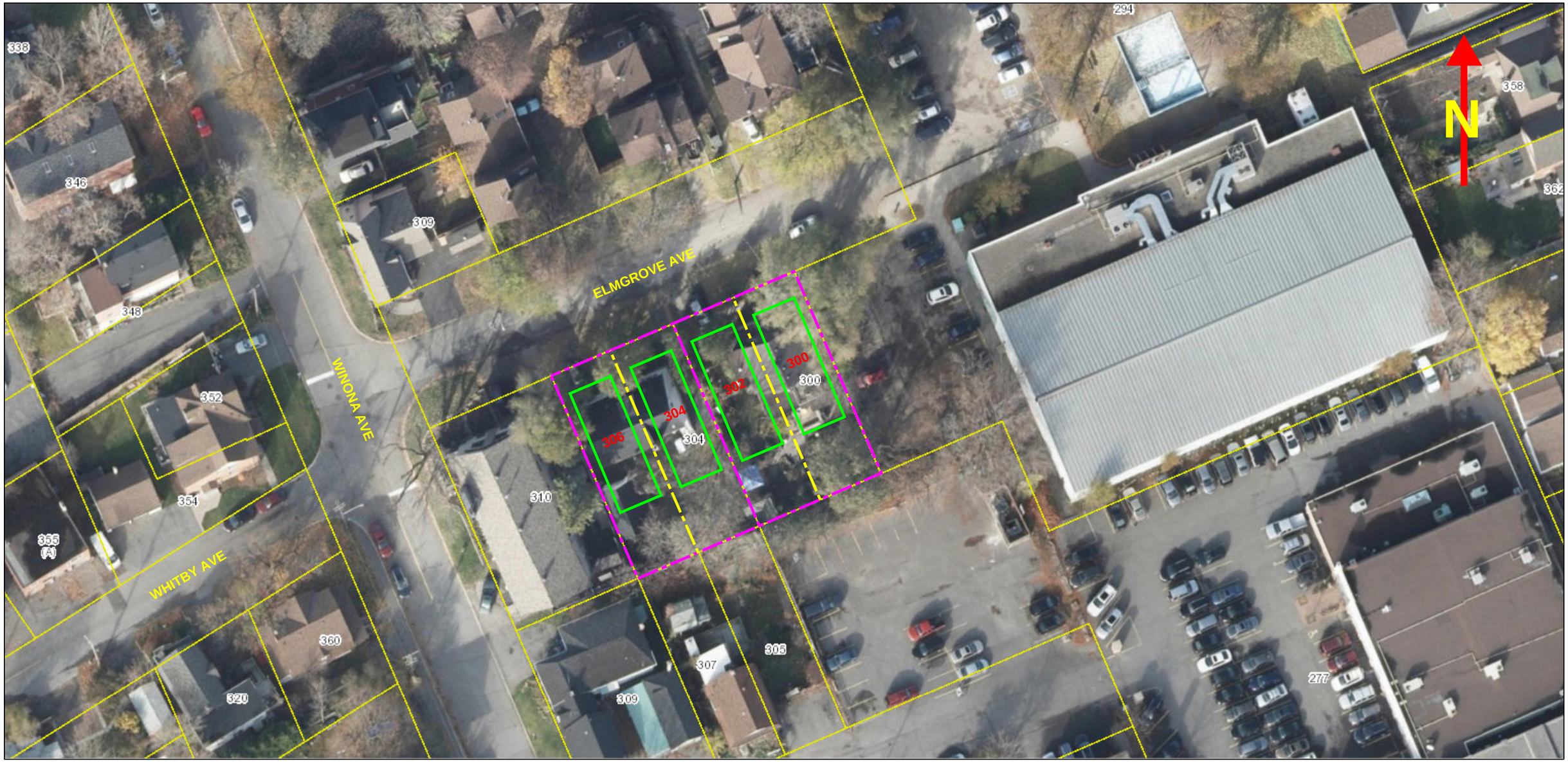
Property Parcels

0 0.0425 0.085 0.17 mi

0 0.05 0.1 0.2 km

City of Ottawa

Figure 2 Proposed Site Plan



April 26, 2019

Addresses

Property Parcels

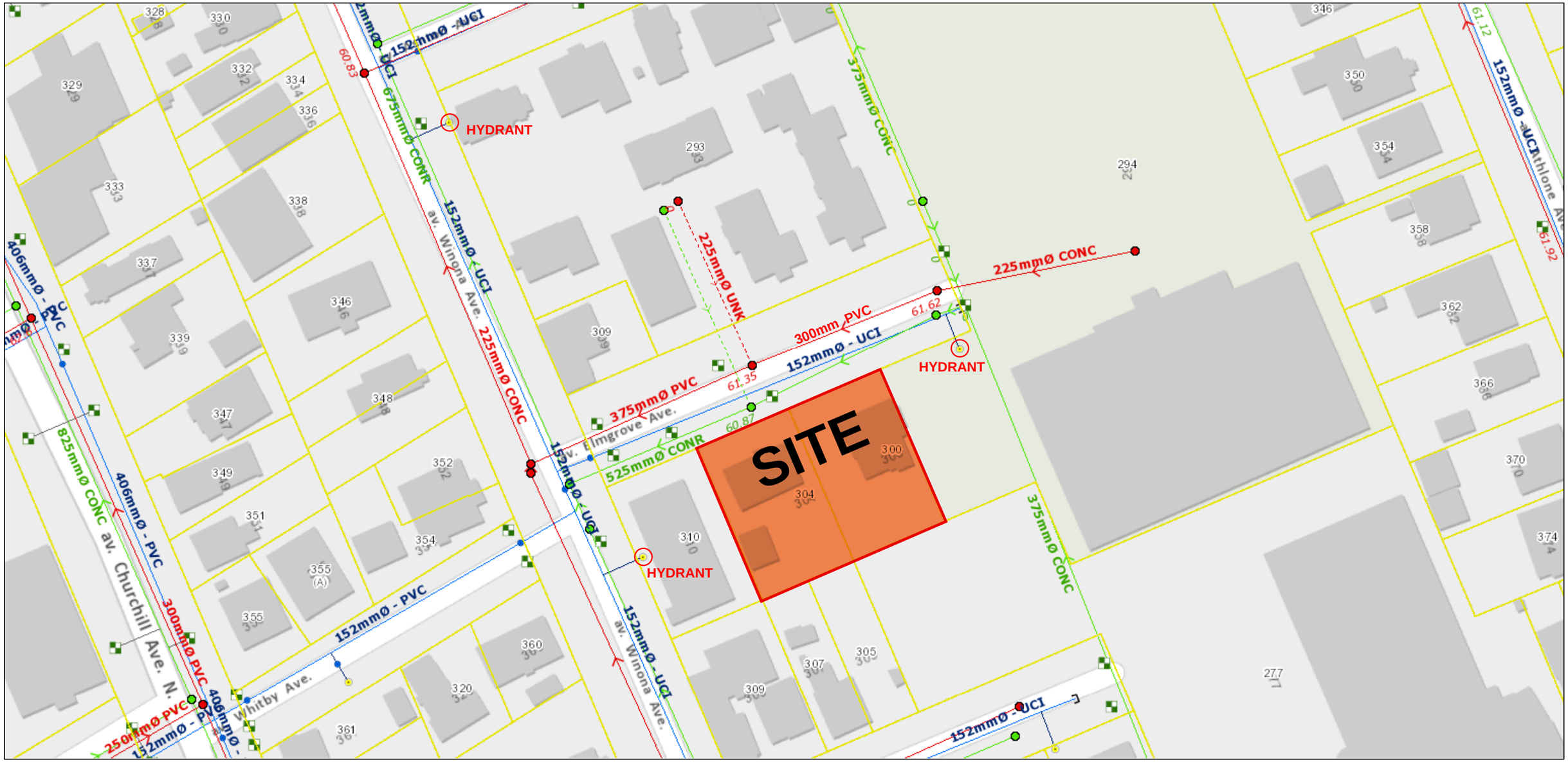
1:750

0 0.0075 0.015 0.03 mi

0 0.0125 0.025 0.05 km

City of Ottawa

Figure 3 Existing Services



April 26, 2019

1:1,000

0 0.01 0.02 0.04 mi

0 0.0175 0.035 0.07 km

City of Ottawa

Addresses

Property Parcels

Upstream Invert / Radier amont

Sanitary Pipe Details / Détails de la conduite de réseau d'égout domestique

Sewer Fittings / Raccords

Cap / bouchon

Tee / raccord en T

Sanitary Manholes / Regards d'égout domestique

Sanitary Pipes / Conduites d'égout domestique

Private / Branchement privé

Public / Branchement public

Sanitary Pump Stations and Treatment Plants / Installations d'infrastructure

Sanitary Pump Station / Station de pompage des eaux usées

Wastewater Treatment Plant / Usine d'épuration des eaux usées

Upstream Invert / Radier amont

Downstream Invert / Radier aval

Storm Pipe Details / Détails de la conduite d'eaux pluviales

Catch Basins / Puisards

Storm Inlets / Prises d'entrée des eaux pluviales

Storm Outlets / Prises de sortie des eaux pluviales

Storm Manholes / Regards de conduites d'eaux pluviales

requested for fire protection from the existing 150mm diameter watermain on Elmgrove Avenue. The City indicated that there is only 60 L/s of available flow at a pressure of 20 psi. The low flow available at this location is due to a dead end watermain that supplies minimal properties and the existing hydrant on Elmgrove Ave.

The fire flow required for the proposed development as indicated previously is 8,000 L/min based on the FUS guidelines. As per the City of Ottawa Technical Bulletin ISTB-2018-02 Appendix I, the aggregate fire flow of all contributing fire hydrants within 150m of the site should not be less than the required fire flow. In the case of the proposed development there are three class AA (blue top) hydrants within 150m of site. The total combined aggregate flow from the three existing hydrants as per Table 1 in the ISTB-2018-02 technical bulletin would allow for a total fire flow of 13,300 L/min.

The results of the water analysis show there is adequate flow and pressure in the existing 152mm watermain in Elmgrove Avenue to meet the required domestic and fire flow demands for the proposed additional units.

SANITARY SERVICING

There is an existing 300mm and 375mm diameter sanitary sewer in Elmgrove Avenue that currently services the subject site. Refer to **Figure 3 Existing Services**. The peak sanitary flow from the original four triplex buildings was calculated to be 0.29 L/s. The increase in peak sanitary flow from the additional basement unit in each building was calculated to be 0.09 L/s for a total peak flow of 0.38 L/s. The sanitary flow calculations are based on criteria provided in the City of Ottawa Sewer Design Guidelines. Refer to **Appendix B** for detailed calculations.

According to the sanitary sewer information provided on the GeoOttawa website, the existing 300mm diameter sanitary sewer in Elmgrove Avenue has a slope 0.73% which has a theoretical capacity of 82.5 L/s. The existing 375mm diameter sanitary sewer in Elmgrove Avenue has a slope of 0.16% which has a theoretical capacity of 70.1 L/s. The addition of a two-bedroom unit in each building increases the peak sanitary flows by only 0.09 L/s. Therefore, the additional flows will have a negligible impact on the existing sewer.

STORM SERVICING AND STORMWATER MANAGEMENT

There is an existing 525mm diameter storm sewer in Elmgrove Avenue that currently services the subject properties. Refer to **Figure 3 Existing Services**. The surface drainage from the site sheet drains towards the existing catchbasin fronting the development in Elmgrove Avenue. The foundation drainage from the proposed building is connected to the Elmgrove Avenue storm sewer.

Stormwater management (quantity and quality control of stormwater) is not required by the City of Ottawa for the proposed development. The addition of a basement unit will not increase storm drainage for the proposed development. Therefore, there are no concerns for storm servicing and there will be no adverse impacts on the existing infrastructure.

CONLUSION

Based on the foregoing, the existing sanitary sewer, storm sewer and watermain infrastructure can adequately service the proposed additional units at 300-306 Elmgrove Avenue.

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Prepared by:

Cara Ruddle, P.Eng
Senior Project Manager | Land Development

List of Appendices:

Appendix A:	Water Calculations
Appendix B:	Sanitary Sewer Calculations

APPENDIX A

Water Calculations

Table 1
Water Demand

Node	Residential Population			Residential Demand (L/s)		
	Units		Total Population	Avg Day	Max. Daily	Peak Hour
	Units	POP				
Proposed Development	16	34	34	0.14	0.34	0.75

Design Parameters:

- 2 Bed Apartment	2.1	pop/unit
Section 4.0 Ottawa Sewer Design Guidelines		
- Average Domestic Flow	350	L/day
Peaking Factors: Table 3-3 Moe Guideline		
Max. Daily Demand:		
- Residential	2.5	x Avg Day
Peak Hourly Demand:		
- Residential	2.2	x Max Day

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

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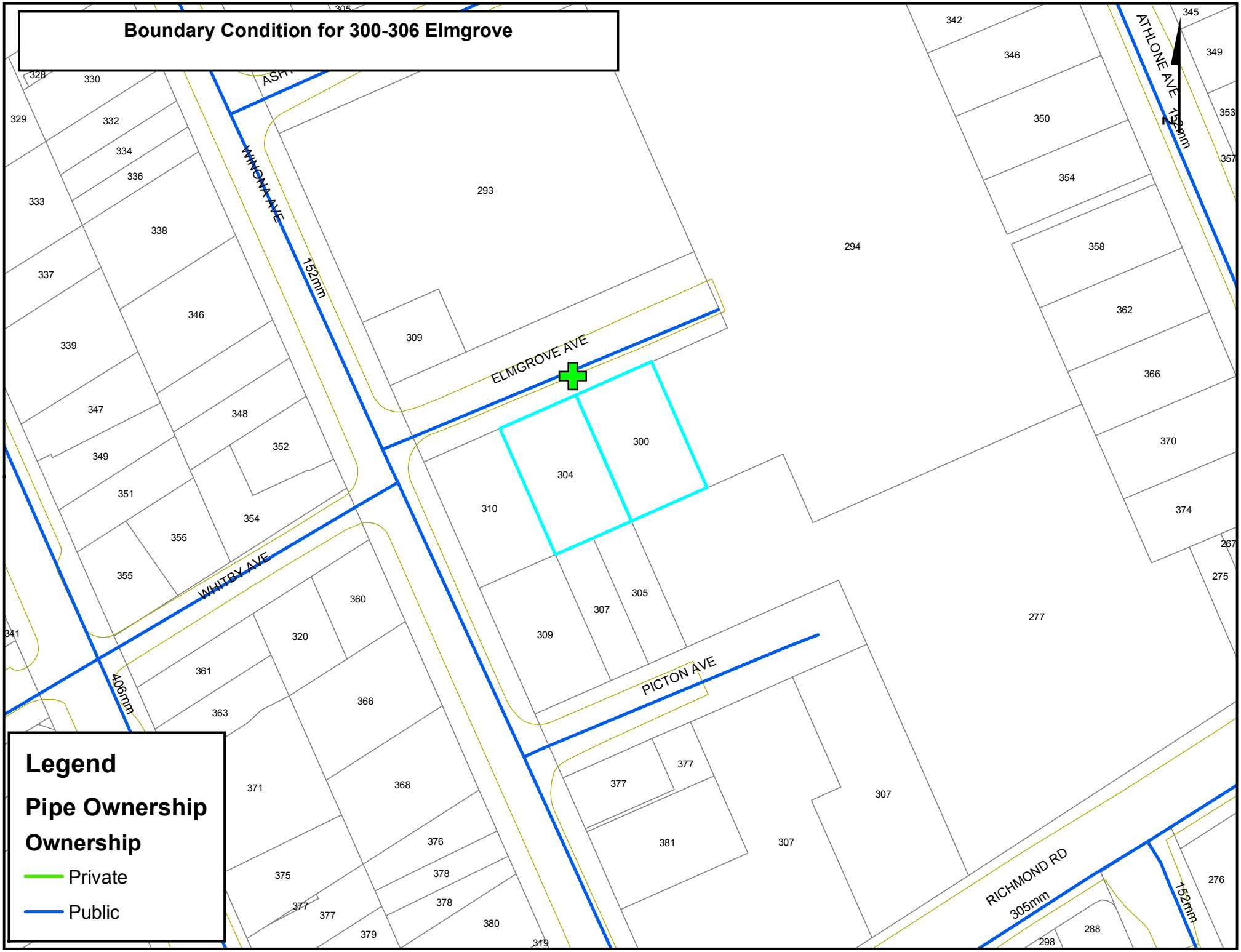
Novatech #: 117210
Project Name: 300-306 Elmgrove Ave.
Date: April 26/ 2019
Input By: Matt Hrehoriak

Legend: Input by User; No Information or Input Required

Building Description: 3 Storey above ground 4 Unit apartment

Step			Choose	Multiplier Options	Value Used	Total Fire Flow (L/min)
	Required Fire Flow					
1	**Construction Material**					
	Coefficient related to type of construction **C**	Wood frame	Yes	1.5	1.5	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Fire resistive construction (< 3 hrs)		0.7		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Gross Floor Area (m^2)	115			
		Number of Floors/Storeys	3			
		Area of structure considered (m^2)			**345**	
	F	**Base fire flow without reductions**				**6,000**
		F = 220 **C** (**A**)$^{0.5}$				
	Reductions or Surcharges					
3	**Occupancy hazard reduction or surcharge**					
	(1)	Non-combustible	Yes	-25%	-25%	**4,500**
		Limited combustible		-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**					
	(2)	Adequately Designed System (NFPA 13)	No	-30%		***0***
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Total	**0%**	
5	***Exposure surcharge (cumulative (%))***					
	(3)	North Side	10.1 - 20 m		15%	**3,375**
		East Side	0 - 3 m		25%	
		South Side	10.1 - 20 m		15%	
		West Side	0 - 3 m		25%	
				Cumulative Total	**75%**	
	(1) + (2) + (3)	**Total Required fire Flow, rounded to nearest 1000L/min**			**L/min**	***8,000***
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**133**
				or	USGPM	2,114
		Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	960


Boundary Condition for 300-306 Elmgrove
WINONA AVE
152mm
ELMGROVE AVE
WHITBY AVE
406mm
PICTON AVE
ATHLONE AVE
152mm
RICHMOND RD
305mm
152mm
Legend
Pipe Ownership
Ownership
Private
Public

Matthew Hrehoriak

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Tuesday, April 30, 2019 8:48 AM
To: Matthew Hrehoriak
Subject: RE: 300-306 Elmgrove Boundary Condition Request
Attachments: 300-306 Elmgrove April 2019.pdf

Good morning Mr. Hreboriak.

As per your request, please find the boundary conditions for your site as per below:

The following are boundary conditions, HGL, for hydraulic analysis at 300-306 Elmgrove (zone 1W) assumed to be connected to the 152mm on Elmgrove (see attached PDF for location).

Minimum HGL = 108.8m

Maximum HGL = 115.0m

Available Flow @20psi = 60L/s, assuming a ground elevation of 62.9m

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.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

Please consider the environment before printing this email

From: Wessel, Shawn
Sent: April 26, 2019 2:30 PM
To: 'Matthew Hrehoriak' <m.hrehoriak@novatech-eng.com>
Subject: RE: 300-306 Elmgrove Boundary Condition Request

Thank you for your email Mr. Hrehoriak.

I will pass on your request to our Water Distribution Dept. for their comments.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
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Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

Please consider the environment before printing this email

From: Matthew Hrehoriak <m.hrehoriak@novatech-eng.com>
Sent: April 26, 2019 11:54 AM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Subject: 300-306 Elmgrove Boundary Condition Request

Hi Shawn,

Please find below water demand information for the proposed development at 300-306 Elmgrove Avenue. Also, attached is a key plan showing the site location. Please provide boundary conditions for the existing watermain infrastructure highlighted on the attached plan so we can confirm the existing infrastructure has capacity for the proposed development.

Water Demands proposed development:

AVG DAY = 0.14L/s
MAX DAY = 0.34 L/s
PEAK HOUR = 0.75 L/s
MAX DAY + FIRE =133.34 L/s

Thanks.

Matthew Hrehoriak, P.Eng., Project Engineer | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 273 | Fax: 613.254.5867

'

'

300-306 ELMGROVE AVE
HYDRAULIC ANALYSIS

CALCULATED WATER DEMNADS:

PROPOSED DEVELOPMENT (4-4UNIT APRTMENT BUILDINGS)

AVERAGE DAY =	0.14	L/s
MAXIMUM DAY =	0.34	L/s
PEAK HOUR =	0.75	L/s

CITY OF OTTAWA BOUNDARY CONDITIONS:

BOUNDAY CONDITIONS BASED ON (ZONE 1W) CONNECTION TO 150mm DIA. WATERMAIN ON ELMGROVE AVE.

MINIMUM HGL =	108.8	m
MAXIMUM HGL =	115.0	m

WATERMAIN ANALYSIS:

ELMGROVE AVE WATERMAIN CONNECTIONS

AVERAGE GROUND ELEVATION = 63.95 m

HIGH PRESSURE TEST = MAX HGL - AVG GROUND ELEV x 1.42197 PSI/m < 80 PSI

HIGH PRESSURE = 72.6 PSI

LOW PRESSURE TEST = MIN HGL - AVG GROUND ELEV x 1.42197 PSI/m > 40 PSI

LOW PRESSURE = 63.8 PSI

THE EXISTING 150mm DIAMETER WATERMAIN IN ELMGROVE AVENUE PASSES THE DOMESTIC DEMAND ANALYLIS TESTS, THEREFORE THERE IS CAPCITY IN THE EXISTING INFRASTRUCTURE FOR THE PROPOSED ADDITION.

APPENDIX B

Sanitary Sewer Calculations

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300-306 ELMGROVE AVE
SANITARY FLOWS

JOB #: 117210
DATE: APRIL 2019

PROPOSED 4 4-UNIT APPARTMENT BUILDINGS

NUMBER OF 2 BDR UNITS	16	
PERSONS PER 2 BDR UNIT	2.1	
TOTAL POPULATION	34	
AVERAGE DAILY FLOW	280	L/c/day
PEAK FACTOR (HARMON FORMULA)	3.48	
PEAK SANITARY FLOW	0.38	L/s

ORIGIANL 4 TRIPLEX BUILDINGS

NUMBER OF 2 BDR UNITS	12	
PERSONS PER 2 BDR UNIT	2.1	
TOTAL POPULATION	26	
AVERAGE DAILY FLOW	280	L/c/day
PEAK FACTOR (HARMON FORMULA)	3.49	
PEAK SANITARY FLOW	0.29	L/s