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500 Old Patrick Street City of Ottawa

Site Servicing Brief



Engineering excellence. Planning precision. Inspired landscapes.

Site Servicing Brief
500 Old St Patrick Street
City of Ottawa

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

March 28th 2019

Novatech File: 119038
Ref: R-2019-052

March 28, 2019

City of Ottawa
Planning, Infrastructure and Economic Development Department
Planning and Infrastructure Approvals
110 Laurier Avenue West, 9th Floor
Ottawa, ON K1P 1J1

Attention: Richard Buchanan, CET
Project Manager, Development Approvals Central

Dear Sir:

Reference: Servicing Brief
Proposed Additional Permitted Building Use
500 Old St Patrick Street, Ottawa
Our File No.: 119038

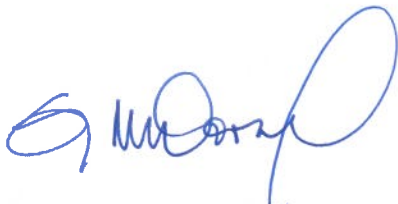
Enclosed is the 'Site Servicing Brief' for the proposed conversion of part of the existing commercial building located at 500 Old St Patrick Street in the City of Ottawa into school classrooms.

This report addresses the adequacy of the existing municipal services in relation to the proposed addition of 'School' as a permitted use and is submitted in support of a Zoning By-Law Amendment application.

Please contact the undersigned, should you have any questions or require additional information.

Yours truly,

NOVATECH



Greg MacDonald, P.Eng.
Director | Land Development and Public Sector Infrastructure

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1.0 INTRODUCTION

It is proposed to convert a portion of the existing commercial building located at 500 Old St-Patrick Street, in the City of Ottawa, into up to 8 school classrooms with supporting facilities including washroom facilities and administrative space. Novatech has been retained to complete a Site Servicing Brief for the proposed partial building conversion.

1.1 Purpose

The purpose of this brief is to confirm that the existing municipal services within the vicinity of the site are adequate to accommodate the proposed change in building use. This report has been prepared in support of a zoning by-law amendment application.

The City of Ottawa design guidelines for sewer systems and water distribution including relevant technical bulletins have been used to estimate the theoretical servicing requirements of the site. GeoOttawa has been used to establish the existing municipal services located adjacent to the subject site.

1.2 Location and Site Description

The subject site is located at 500 Old St. Patrick Street in the City of Ottawa, as shown in **Figure 1 (Aerial Plan)** and is approximately 4,210 square metres in area.

The site is bordered by Old St. Patrick Street and De La Salle French Public Secondary School to the north, residential buildings to the west, a church and a health clinic to the east and Murray Street and a residential building to the south.

Figure 1 – Aerial Plan provides an aerial view of the site.



Image Source: geoOttawa (City of Ottawa)

The subject site is occupied by two (2) one-storey buildings joined by a roof structure with a total footprint of approximately 1,990 square metres (21,420 square feet). As the buildings are close together, joined and share common services, they are considered to be one (1) building for the purpose of this report. The building is currently divided into 4 separate units with the following uses:

- Unit #1: Ste-Anne Medical Centre
- Units #3 and #4: Currently vacant
- Unit #5: Dance school

1.3 Proposed Partial Building Conversion

It is proposed to convert Units #3 and #4 into up to eight (8) school classrooms with supporting facilities including washroom facilities and administrative space for use by Conseil des écoles publiques de l'Est de l'Ontario (CEPEO).

The classrooms will be able to accommodate approximately 150 students and 15 employees. Units #1 and #5 will remain as existing.

Figure 2 – Conceptual Plan (by CEPEO) provides a conceptual layout of the proposed conversion of Units #3 and #4 into school classrooms.



2.0 SANITARY SERVICING

An existing 300mm dia. municipal sanitary sewer located in Old St. Patrick Street provides an outlet for sanitary flows from the site. Refer to **Figure 3 (Existing Services)**, which shows the existing municipal services in the vicinity of the site.

Based on sewer invert information obtained from geoOttawa, the estimated capacity of the 300mm dia. municipal sanitary sewer across the property frontage varies between approximately 80 L/s to 100 L/s.

The theoretical sanitary flows for the existing and proposed building uses for the site are summarized below in **Table 1**.

Table 1: Theoretical Sanitary Flows for the Existing and Proposed Building Uses

Unit # and Use	Design Assumptions	Design Flow	Average Flow (L/s)	Peaking Factor	Peak Flow (L/s) ³
Existing Building Use					
#1 and #5: Commercial	0.241 ha commercial ¹	28,000 L/gross ha/d	0.08	1.5	0.20
#3 and #4: Commercial	0.180 ha commercial ¹		0.06	1.5	0.15
Total	-	-	0.14	-	0.34
Proposed Building Uses					
#1 and #5: Commercial	Same as existing		0.08	1.5	0.20
#3 and #4: School Classrooms	150 students, 15 employees	30 L/person/d ²	0.17	1.5	0.32
Total	-	-	0.25	-	0.51

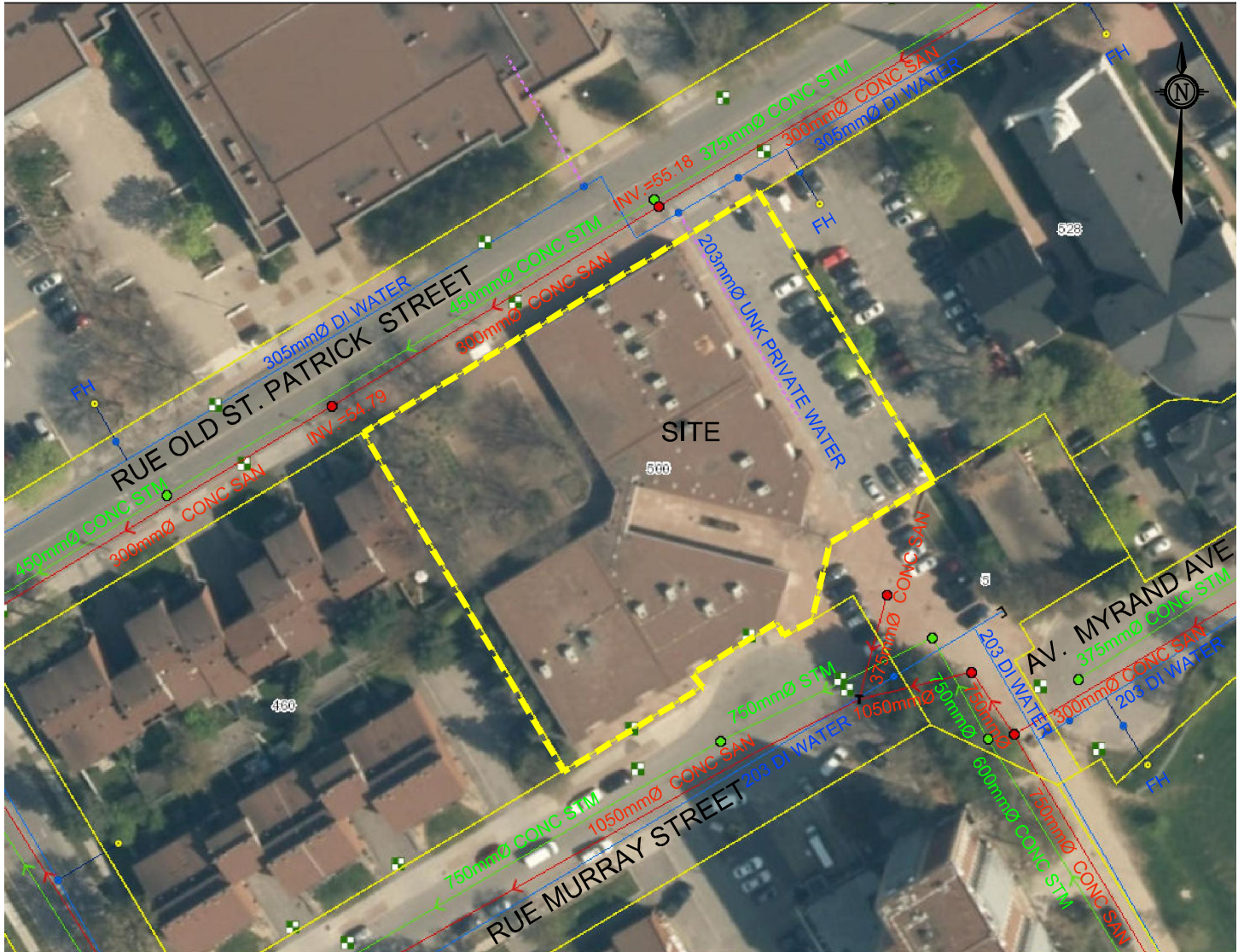
¹ – Prorated gross site areas from share of total gross floor area of buildings.

² – Day school without cafeteria or gym and showers, 8-hour day assumed.

³ – Peak Flows include Extraneous Flow (0.33 L/s/ha allowance).

Refer to **Appendix A** for detailed calculations and design criteria. These were taken from Section 4 – ‘Sanitary Sewer Systems’ and Appendix 4-A - ‘Daily Sewage Flow for Various Types of Establishments’ of the City of Ottawa Sewer Design Guidelines, incorporating the revisions as per Technical Bulletin ISTB-2018-01, and Section 8.2.1.3 ‘Sewage System Design Flows’ of the Ontario Building Code.

Based on the theoretical sanitary flow calculations, the peak sanitary flow from the site will increase by approximately 0.17 L/s to be approximately 0.51 L/s. Considering the capacity of the



NOTES

1. AERIAL AND EXISTING MUNICIPAL SERVICES INFORMATION OBTAINED FROM GEOOTTAWA.



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LEGEND

EXISTING MUNICIPAL SERVICES:

- EX WATERMAIN
- EX SANITARY
- EX STORMWATER
- FH EX FIRE HYDRANT

500 OLD ST. PATRICK ST

EXISTING SERVICES

SCALE 1 : 1000

DATE MAR 2019 JOB 119038 FIGURE 3

municipal sanitary sewer in Old St. Patrick St is between 80-100 L/s, this increase in flow is considered negligible.

3.0 WATER SERVICING

An existing 305mm dia. municipal watermain is located adjacent to the site in Old St. Patrick Street. The existing building is connected to this watermain by a 203mm dia. private watermain. Refer to **Figure 3 (Existing Services)** for the location of the municipal watermain and **Appendix C** for a plan of the existing internal building services.

3.1 Average Day, Maximum Day and Peak Hour Demands

The theoretical domestic water demands for the existing and proposed building uses are summarized below in **Table 2**.

Table 2: Theoretical Water Demands for the Existing and Proposed Building Uses

Unit # and Use	Design Assumptions	Design Flow	Avg. Day Demand (L/s)	Max. Day Demand (L/s)	Peak Hour Demand (L/s)
Existing Building Use					
#1 and #5: Commercial	0.241 ha commercial ¹	28,000 L/gross ha/d	0.08	0.12	0.22
#3 and #4: Commercial	0.180 ha commercial ¹		0.06	0.09	0.16
Total	-	-	0.14	0.21	0.38
Proposed Building Uses					
#1 and #5: Commercial	Same as existing		0.08	0.12	0.22
#3 and #4: School Classrooms	150 students, 15 employees	30 L/person/d ¹	0.17	0.26	0.47
Total	-	-	0.25	0.38	0.69

¹ – Assumed to be the same as the average sanitary flow, same assumptions used.

Refer to **Appendix B** for detailed calculations and design criteria. These were taken from the City of Ottawa Water Design Guidelines. The average water demands per student and per employee were assumed to be the same as average sanitary design flows.

3.2 Water Supply for Fire-Fighting

The Fire Underwriters Survey (FUS) was used to estimate fire flow requirements for the existing buildings. Non-combustible construction was assumed due to the size and occupancy of the building. No changes to the exterior of the building are proposed. The whole building is

sprinklered. There are three (3) existing municipal fire hydrants within 75m of the property. Refer to **Figure 3 (Existing Services)** for their locations.

It should be noted that fire flow requirements calculated using the FUS method tend to generate higher values when compared to flows being calculated using the Ontario Building Code (OBC).

Table 3 summarizes the Fire Flow Requirement for the existing building, based on FUS calculations.

Table 3: Fire Flow Requirements

Use	Fire Flow Demand USGPM (L/s)
Existing (Commercial) and Proposed (Commercial/Institutional)	2,378 USGPM (150 L/s)

Refer to **Appendix B** for a copy of the FUS fire flow calculations.

3.3 Municipal Boundary Conditions and Multi Hydrant Analysis

The preliminary water demand and fire flow calculations presented above were provided to the City of Ottawa. These values were used to generate municipal watermain network boundary conditions and to perform a multi hydrant analysis.

Table 4 summarizes the boundary conditions provided by the City of Ottawa for the existing municipal watermain network. Refer to **Appendix B** for email correspondence with the City of Ottawa.

Table 4: Hydraulic Boundary Conditions Provided by the City

Condition	Municipal Watermain Boundary Condition
Minimum HGL	106.2 m
Maximum HGL	114.5 m

Table 5 summarizes the water demands for proposed building uses under the various operating conditions and compares the anticipated operating pressures at the existing water service connection to the acceptable operating pressures outlined in the City of Ottawa Design Guidelines.

Table 5: Water Analysis Results Summary

Condition	Total Water Demand (L/s)	Approximate Design Operating Pressures (psi) / (Relative Head) (m) ¹	Acceptable Municipal Operating Pressures (psi)
Average Demand	0.25	79.6 psi (56.0m)	40-80 psi
Peak Hour Demand	0.69	67.8 psi (47.7 m)	40-80 psi

¹ - The building finished floor elevation is approximately at 58.5 m.

Since operating pressures may be greater than 80 psi during average demand, it is recommended that pressures be checked within the building and a pressure reducing valve be installed on incoming services if the measured pressure is greater than 80 psi.

The City of Ottawa performed a multi hydrant analysis assuming the three (3) hydrants within 75m of the property were running simultaneously. The maximum available flow for each hydrant as provided by the City is 95 L/s, meaning a total of 285 L/s is available for fire flow. Refer to **Appendix B** for email correspondence with the City of Ottawa.

Based on the above analysis, the existing municipal watermains can provide adequate water supply (domestic and fire) to the existing building under the proposed partial building conversion.

4.0 STORMWATER

The existing 375mm dia. municipal storm sewer located in Old St. Patrick Street provides an outlet for stormwater runoff from the site. Refer to **Figure 3 (Existing Services)**.

As no changes are being proposed to the building footprint and the imperviousness of the site will remain unchanged, there will be no change to the stormwater flows from the site.

5.0 CONCLUSIONS

This site servicing brief has been prepared in support of a zoning by-law amendment application for the proposed addition of “school” as a permitted use for the existing building located at 500 Old St. Patrick Street.

The conclusions are as follows:

- Units #3 and #4 in the existing single storey commercial building will be converted into up to 8 school classrooms with supporting facilities including washroom facilities and administrative space. No modifications are proposed to the building footprint.
- The proposed building conversion will increase the theoretical peak sanitary flow from the site by approximately 0.17 L/s to be approximately 0.51 L/s. This increase is considered negligible compared to the estimated capacity of the existing 300mm dia. municipal sanitary sewer in Old St. Patrick Street.
- The existing 305mm dia. municipal watermain in Old St. Patrick is fully adequate to service the development.

- There will be no changes to the stormwater runoff from the site.
- Based on the above, the proposed partial building conversion can be adequately serviced by the existing municipal watermain and sewers.

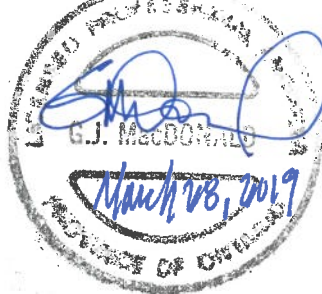
NOVATECH

Prepared by:

LBolam

Lydia Bolam, B. Eng.
E.I.T.

Reviewed by:



Greg MacDonald, P. Eng.
Director | Land Development and
Public Sector Infrastructure

Appendix A

Sanitary Flow Calculations

LOCATION		COMMERCIAL FLOW				INSTITUTIONAL FLOW				EXTRANEOUS FLOW		TOTAL FLOWS			
Use	Total Area (prorated)	Gross Floor Area	Avg Flow	Peak Factor	Comm. Peak Flow	School		Avg Flow	Peak Factor	Inst. Peak Flow	Dry Weather (l/l dry)	Infiltration Allowance Wet Weather (l/l wet)	Average Dry Weather Flow (ADWF)	Peak Dry Weather Flow (PDWF)	Peak Wet Weather Flow (PWWWF)
	(ha)	(m2)	(l/s)	-	(l/s)	Students (persons)	Employees (persons)	(l/s)	-	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)
EXISTING USAGE															
Units 3 and 4 - Commercial	0.180	850	0.06	1.50	0.09						0.01	0.05	0.07	0.10	0.15
Units 1 and 5 - Commercial	0.241	1140	0.08	1.50	0.12						0.01	0.07	0.09	0.13	0.20
	0.421	1990	0.14		0.20						0.02	0.12	0.16	0.23	0.34
PROPOSED PARTIAL CHANGE OF BUILDING USE															
Units 3 and 4 - School	0.180	850				150	15	0.17	1.5	0.26	0.01	0.05	0.18	0.27	0.32
Units 1 and 5 - Commercial	0.241	1140	0.08	1.50	0.12						0.01	0.07	0.09	0.13	0.20
	0.421	1990	0.08	1.50	0.12			0.17	1.5	0.26	0.02	0.12	0.27	0.40	0.51
Design Parameters:															
Commercial Average Flow	28,000	L/gross ha/day	Peak Extraneous Flows			Infiltration Allowance (Dry Weather)			0.05	L/s/ha	LGB Checked: GJM				
School Average Flow	(8-hour day assumed)		Infiltration Allowance (Wet Weather)			0.28	L/s/ha								
Day school without cafeteria or Gym and showers	30	L/person	Infiltration Allowance (Total l/l)			0.33	L/s/ha								
Peaking Factors	1.0	if commercial contribution <20%													
Commercial / Institutional	1.5	if commercial contribution >20%													
Date:											March 22, 2019				



Appendix B
Water Demand and FUS Calculations
and Relevant Correspondence

500 Old St. Patrick St
PRELIMINARY WATER
DEMAND
CALCULATIONS

JOB NO. 119038

Water Demand						
	Use	Commercial	School	Demands (L/s)		
		Area (ha)	Number of Students + Employees	Average Day	Max. Daily	Peak Hour
Existing	Units 3+4 - Commercial-Zoned	0.180		0.06	0.09	0.16
	Units 1+5 - Commercial	0.241		0.08	0.12	0.22
				0.14	0.21	0.38
Proposed	Units 3+4 - School	0.180	165	0.17	0.26	0.47
	Units 1+5 - Commercial	0.241		0.08	0.12	0.22
				0.25	0.38	0.69

Notes:

Avg. Day Demand (from City of Ottawa Guidelines):

- Commercial 28000 L/gross ha/day

- School 30 L/day/person (8-hour day assumed)
(Assumed to be the same as the average sanitary flow for day school without cafeteria of gym and showers)

Max. Daily Demand:

- Commercial 1.5 x Avg. Day
- Institutional 1.5 x Avg. Day

Peak Hour Demand:

- Commercial 1.8 x Max. Day
- Institutional 1.8 x Max. Day

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners & Landscape Architects

Novatech Project #: 119038

Project Name: 500 Old St. Patrick St

Date: 3/22/2019

Input By: LGB

Reviewed By: ARM

Legend

Input by User

No Information or Input Required

Building Description: 1 Storey Commercial (Brick Veneer)

Non-combustible construction

Step			Input		Value Used	Total Fire Flow (L/min)	
Base Fire Flow							
1	Construction Material			Multiplier			
	Coefficient related to type of construction C	Wood frame		1.5	0.8		
		Ordinary construction		1			
		Non-combustible construction	Yes	0.8			
		Modified Fire resistive construction (2 hrs)		0.6			
		Fire resistive construction (> 3 hrs)		0.6			
2	Floor Area					8,000	
	A	Building Footprint (m ²)	1990				
		Number of Floors/Storeys	1				
		Area of structure considered (m ²)			1,990		
	F	Base fire flow without reductions					
	F = 220 C (A)^{0.5}						
Reductions or Surcharges							
3	Occupancy hazard reduction or surcharge			Reduction/Surcharge		8,000	
	(1)	Non-combustible		-25%	0%		
		Limited combustible		-15%			
		Combustible	Yes	0%			
		Free burning		15%			
		Rapid burning		25%			
4	Sprinkler Reduction			Reduction		-3,200	
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%		
		Standard Water Supply	Yes	-10%	-10%		
		Fully Supervised System	No	-10%			
		Cumulative Total			-40%		
5	Exposure Surcharge (cumulative %)			Surcharge		4,400	
	(3)	North Side	20.1 - 30 m		10%		
		East Side	10.1 - 20 m		15%		
		South Side	20.1 - 30 m		10%		
		West Side	3.1 - 10 m		20%		
		Cumulative Total			55%		
Results							
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min			L/min	9,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)			or	L/s	150
					or	USGPM	2,378
7	Storage Volume	Required Duration of Fire Flow (hours)			Hours	2	
		Required Volume of Fire Flow (m ³)			m ³	1080	

Lydia Bolam

From: Buchanan, Richard <Richard.Buchanan@ottawa.ca>
Sent: Wednesday, March 27, 2019 8:45 AM
To: Lydia Bolam
Subject: FW: 500 Old St Patrick St - Watermain Boundary Condition Request
Attachments: 500 Old St Patrick March 2019.pdf

Hi Lydia;

The following are boundary conditions, HGL, for hydraulic analysis at 500 Old St-Patrick (zone 1W) assumed to be connected to the 305mm on Old St-Patrick (see attached PDF for location).

Minimum HGL = 106.2m

Maximum HGL = 114.5m. The maximum pressure is estimated to be above 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

As requested by the consultant, a multi-hydrant analysis was completed at the following locations (see attached PDF for hydrants location):

- H1 (305mm on Old St-Patrick)
- H2 (305mm on Old St-Patrick)
- H3 (203mm on Myrand)

Multi Hydrant Analysis assuming all three hydrants running simultaneously:

	Maximum Flow	Assumptions
H1	95 L/s	Within 75m of property and capped at 95 L/s as per technical bulletin ISTB-2018-02
H2	95 L/s	Within 75m of property and capped at 95 L/s as per technical bulletin ISTB-2018-02
H3	95 L/s	Within 75m of property and capped at 95 L/s as per technical bulletin ISTB-2018-02
total	285 L/s	

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.

Richard Buchanan, CET

Project Manager, Development Approvals
Planning, Infrastructure and Economic Development Department
Planning & Growth Management Branch
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☎ 613.580.2424 ext./poste 27801
ottawa.ca/planning / ottawa.ca/urbanisme

From: Lydia Bolam <l.bolam@novatech-eng.com>
Sent: Mar 22, 2019 11:38 AM
To: "James, Douglas" <Douglas.James@ottawa.ca>; "Buchanan, Richard" <Richard.Buchanan@ottawa.ca>
Cc: Greg MacDonald <g.Macdonald@novatech-eng.com>
Subject: 500 Old St Patrick St - Watermain Boundary Condition Request

Hi Doug, Richard,

We would like to request the municipal watermain boundary conditions near the existing building located at 500 Old St Patrick Street. Ideally, the City could provide the boundary conditions at the nearby hydrant locations (see attached Fire Hydrant Locations plan for details) and the maximum available fire flow(s).

It is proposed to convert the usage of part of this building from commercial to school classrooms. No changes to the exterior of the building or services are proposed.

Based on preliminary calculations, using the City of Ottawa Guidelines for Drinking Water Systems, the proposed water demands for the existing 1-storey building with commercial/institutional use are as follows:

- Average Day Demand = 0.25 L/s (calculated using partial general commercial occupancy (0.24 ha gross area), partial institutional occupancy (day school with no gym, cafeteria etc. with 165 students/teachers total at 30L/d/person, 8-hour day)
- Max. Day Demand = 0.37 L/s (1.5 x Avg. Demand, per City Table 4.2)
- Peak Hour Demand = 0.67 L/s (1.8 x Max. Day Demand, per City Table 4.2)

Based on the Fire Underwriters Survey (FUS) Guidelines, the fire flow for the existing building is approximately 150 L/s (see attached FUS calculations sheet).

Please review and provide the requested municipal watermain boundary conditions.

Kind regards,

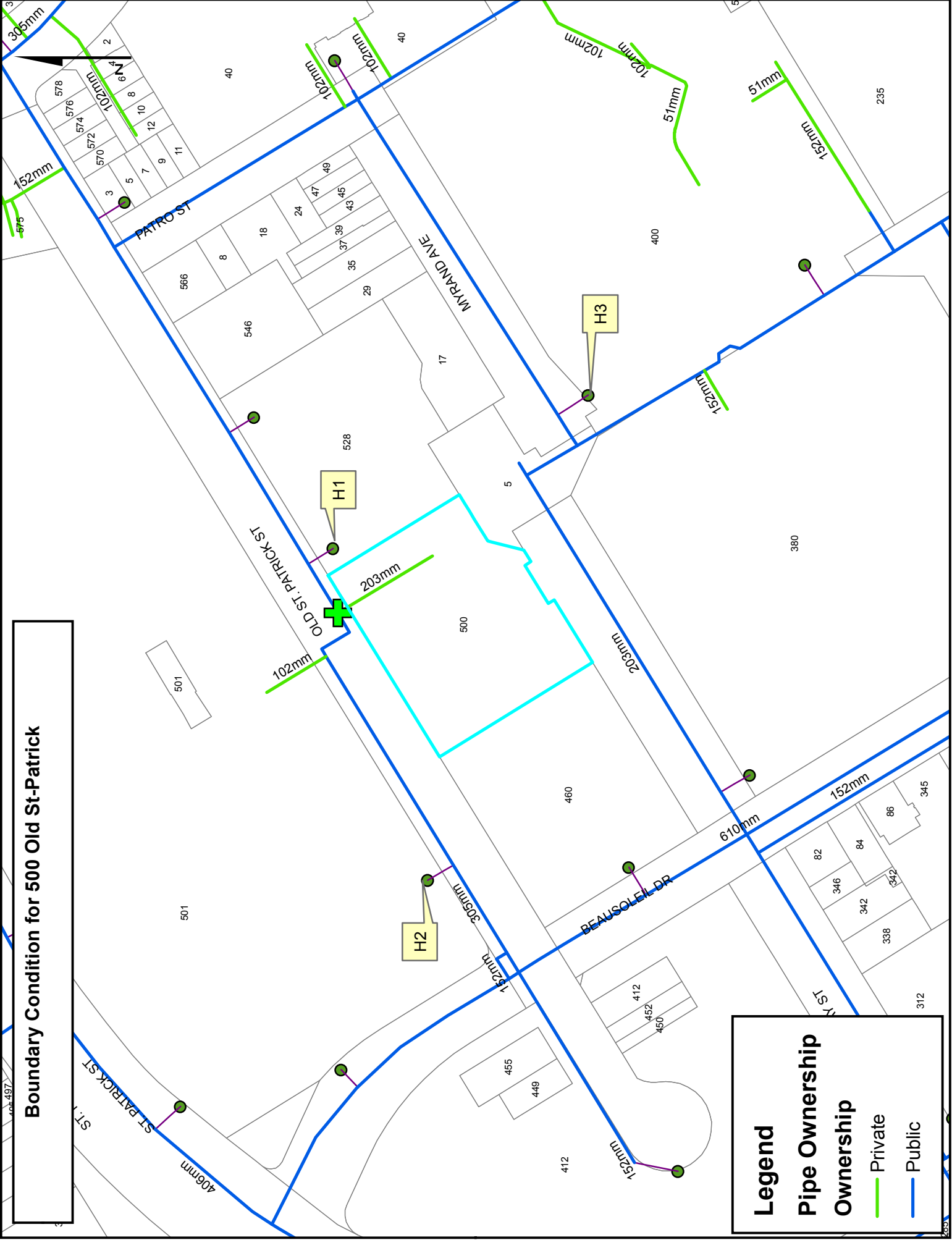
Lydia Bolam, B.Eng., EIT

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext:276 | Fax: 613.254.5867

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Appendix C

Existing Internal Building Services Plan

