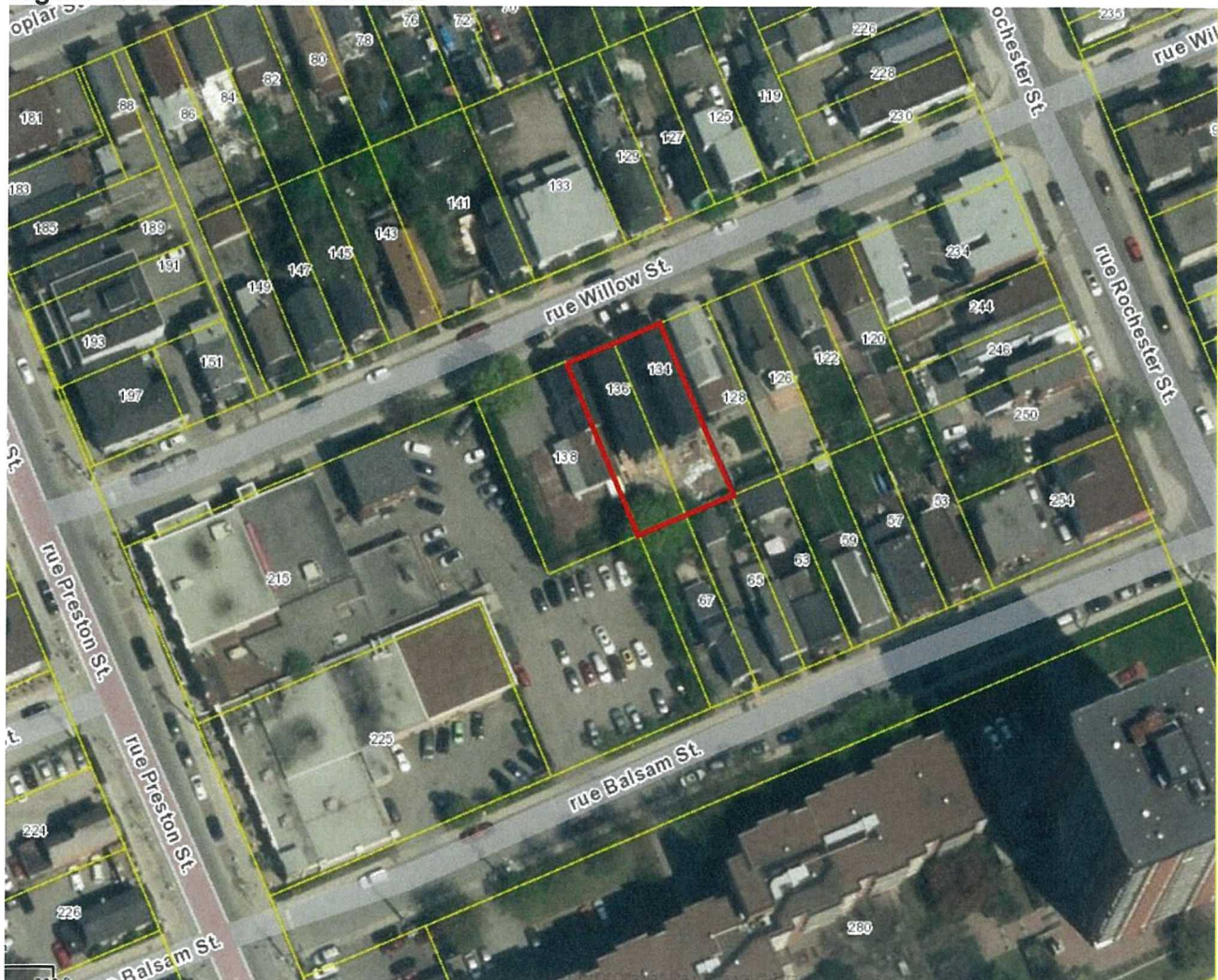


# TECHNICAL MEMORANDUM

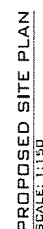
**DATE:** JANUARY 18, 2019  
**TO:** MURRAY CHOWN  
**FROM:** MIROSLAV SAVIC  
**RE:** 134 & 136 WILLOW STREET – SITE SERVICING BRIEF

Novatech has been retained to review the adequacy of existing services for the Zoning By-law Amendment and Site Plan application for the proposed development located at 134 and 136 Willow Street in the City of Ottawa.

**Figure 1: Aerial View of The Site**



### Figure 2: Site Plan





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

## WATER SERVICING

There is an existing public 305mm diameter watermain in Willow Street that currently services the subject site. Refer to **Figure 3 Existing Services**.

**Figure 3: Existing Services**



The water demands for the proposed development 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 required fire flow was calculated using the Fire Underwriter's Survey method and is based on 3-storey above ground wood frame construction. The fire area considered includes adjacent one and a half storey wood frame house at 138 Willow Street that is separated by less than 3m from the proposed apartment buildings.

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	0.07 L/s	80 psi (Max)	72.5 psi
Max Day + Fire Flow	150.17 L/s	20 psi (Min)	61.1 psi
Peak Hour	0.38 L/s	40 psi (Min)	61.9 psi

The results of the water analysis show there is adequate flow and pressure in the existing 305mm watermain in Willow Street to meet the required domestic and fire flow demands.

## SANITARY SERVICING

There is an existing 1050mm combined sewer in Willow Street that currently services the subject site. Refer to **Figure 3 Existing Services**.

The increase in peak sanitary flow from the two additional units is calculated to be 0.04 L/s. The total peak sanitary flow generated by the proposed units is calculated to be 0.19 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 information provided on the GeoOttawa website, the existing 1050mm diameter combined sewer in Willow Street at approximately 1.0% slope has a capacity of 2848 L/s.

Since the addition of two units increases the peak flow by only 0.04 L/s from the existing condition, there are no concerns that the proposed development flows will have any adverse effects on the existing infrastructure.

## STORM SERVICING AND STORMWATER MANAGEMENT

The existing 1050mm diameter combined sewer in Willow Street currently services the subject site. Refer to **Figure 3 Existing Services**. The surface drainage from the site sheet drains towards the existing catchbasing in Winona Avenue. The foundation drainage is connected to the Winona Avenue combined sewer.

The stormwater management (quantity and quality control) is not required by the City of Ottawa for the proposed development.

## CONCLUSION

Based on the foregoing, the existing combined sewer and watermain infrastructure can adequately service the proposed development. The stormwater management is not required by the City of Ottawa.

## NOVATECH

Prepared by:



Miroslav Savic, P.Eng  
Senior Project Manager | Land Development

### List of Appendices:

Appendix A: Water Calculations  
Appendix B: Sanitary Sewer Calculations

**APPENDIX A**  
**Water Calculations**

## Miro Savic

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**From:** Buchanan, Richard <Richard.Buchanan@ottawa.ca>  
**Sent:** Tuesday, January 15, 2019 12:06 PM  
**To:** Miro Savic  
**Subject:** 134&136 Willow Street, 341&343 Tweedsmuir Avenue & 211 Loretta Avenue Boundary Conditions  
**Attachments:** 134-136 Willow Jan 2019.pdf; 341-343 Tweedsmuir Jan 2019.pdf; 211 Loretta Jan 2019.pdf

Hi Miro

Boundary Conditions for the three sites requested.

### Richard Buchanan, CET

Project Manager, Development Approvals  
Planning, Infrastructure and Economic Development Department  
Planning & Growth Management Branch  
City of Ottawa | Ville d'Ottawa  
☎ 613.580.2424 ext./poste 27801  
[ottawa.ca/planning](http://ottawa.ca/planning) / [ottawa.ca/urbanisme](http://ottawa.ca/urbanisme)

**Subject:** 134&136 Willow Street - Boundary Conditions

The following are boundary conditions, HGL, for hydraulic analysis at 134-136 Willow (zone 1W) assumed to be connected to the 305mm on Willow St (see attached PDF for location).

Minimum HGL = 107.5m

Maximum HGL = 115.0m

MaxDay + FireFlow (150 L/s) = 107.0m

**Subject:** 341&343 Tweedsmuir Avenue

The following are boundary conditions, HGL, for hydraulic analysis at 341-343 Tweedsmuir (zone 1W) assumed to be connected to the 152mm on Tweedsmuir (see attached PDF for location).

Minimum HGL = 108.8m

Maximum HGL = 114.7m

MaxDay + FireFlow (167 L/s) = 78.5m

**Subject:** 211 Loretta Avenue- Boundary Conditions

The following are boundary conditions, HGL, for hydraulic analysis at 211 Loretta (zone 1W) assumed to be connected to the 203mm on Loretta (see attached PDF for location).

Minimum HGL = 107.3m

Maximum HGL = 114.7m

MaxDay + FireFlow (167 L/s) = 93.0m

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.*

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Boundary Condition for 134-136 Willow St





# FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners & Landscape Architects

Novatech #: 118188

Project Name: 134-136 Willow Street

Date: 10-Jan-19

Input By: Miroslav Savic

Reviewed By:

Legend

Input by User

No Information or Input Required

Building Description: 4-unit Apartment Building

Wood frame

Step			Choose	Multiplier Options	Value Used	Total Fire Flow (L/min)	
	Required Fire Flow						
1	Construction Material						
	Coefficient related to type of construction <b>C</b>	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						
	<b>A</b>	Building Footprint (m <sup>2</sup> )	113				
		Number of Floors/Storeys	3				
		Area of structure considered (m <sup>2</sup> )			495		
	<b>F</b>	Base fire flow without reductions				7,000	
		<b>F = 220 C (A)<sup>0.5</sup></b>					
	Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge						
	(1)	Non-combustible	Yes	-25%	-25%	5,250	
		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%	3,675	
		East Side	0 - 3 m		25%		
		South Side	10.1 - 20 m		15%		
		West Side	10.1 - 20 m		15%		
		Cumulative Total			70%		
	(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
		Required Duration of Fire Flow (hours)			Hours	2	
		Required Volume of Fire Flow (m <sup>3</sup> )			m <sup>3</sup>	1080	

## 134-136 WILLOW STREET WATERMAIN ANALYSIS

### WATER DEMAND

NUMBER OF 2 BDR UNITS	8
PERSONS PER 2 BDR UNIT	2.1
TOTAL POPULATION	17
AVERAGE DAY DEMAND	350 L/c/day
AVERAGE DAY DEMAND	0.07 L/s
MAXIMUM DAY DEMAND (2.5 x avg. day)	0.17 L/s
PEAK HOUR DEMAND (2.2 x avg. day)	0.38 L/s

### BOUNDARY CONDITIONS

MINIMUM HGL =	107.5 m
MAXIMUM HGL =	115.0 m
MAX DAY + FIRE =	107.0 m

### PRESSURE TESTS

AVERAGE GROUND ELEVATION = 64.0 m

HIGH PRESSURE TEST = MAX HGL - AVG GROUND ELEV x 1.42197 PSI/m < 80 PSI  
HIGH PRESSURE = **72.5 PSI**

LOW PRESSURE TEST = MIN HGL - AVG GROUND ELEV x 1.42197 PSI/m > 40 PSI  
LOW PRESSURE = **61.9 PSI**

MAX DAY + FIRE FLOW TEST = MAX DAY + FIRE - AVG GROUND ELEV x 1.42197 PSI/m > 20 PSI  
**61.1 PSI**

**APPENDIX B**  
**Sanitary Sewer Calculations**

## **134-136 WILLOW STREET**

### **SANITARY FLOW**

#### **PROPOSED 4-UNIT APPARTMENT BUILDINGS**

NUMBER OF 2 BDR UNITS	8
PERSONS PER 2 BDR UNIT	2.1
TOTAL POPULATION	17
AVERAGE DAILY FLOW	280 L/c/day
PEAK FACTOR (HARMON FORMULA)	3.51
PEAK SANITARY FLOW	0.19 L/s

#### **EXISTING TRYPLEX BUILDINGS**

NUMBER OF 2 BDR UNITS	6
PERSONS PER 2 BDR UNIT	2.1
TOTAL POPULATION	13
AVERAGE DAILY FLOW	280 L/c/day
PEAK FACTOR (HARMON FORMULA)	3.52
PEAK SANITARY FLOW	0.15 L/s