

# TECHNICAL MEMORANDUM

**DATE:** MAY 20, 2020  
**TO:** ANN O'CONNOR  
**FROM:** CARA RUDDLE  
**RE:** 180 METCALFE STREET – SITE SERVICING BRIEF  
 (ADDITIONAL UNITS)

Novatech has been retained to review the Adequacy of Existing Services in support of an Official Plan Amendment, Zoning By-Law Amendment and Site Plan Amendment application for the development located at 180 Metcalfe Street in the City of Ottawa. Novatech has previously completed the detailed design for site servicing, grading and stormwater management for the 27-storey, 303-unit apartment building with underground parking as part of the Site Plan Approval process. Refer to the Servicing and Stormwater Management Report, revised December 14, 2018 prepared by Novatech for details. The site plan application has been reviewed and approved by the City of Ottawa. Since the time of approval it is proposed to add three additional storeys for a total of 30 storeys and 311 units.

The purpose of this technical memorandum is to review the water and sanitary servicing requirements for the proposed 30-storey, 311-unit apartment building and analysis of the existing infrastructure surrounding the site to ensure there is adequate capacity for the additional units.

## WATER SERVICING

There is an existing 400mm diameter watermain in Metcalfe Street and an existing 300mm diameter watermain in the Nepean Street which are proposed to service the development. In the original December 2018 site plan submission domestic water demands for the proposed apartment building were calculated and provided to the City of Ottawa to obtain boundary conditions to confirm serviceability. The water demand calculations have since been updated to include the additional units. The domestic water demand calculations are based on criteria provided in the City of Ottawa Water Design Guidelines. The water demand calculations are provided in **Appendix A**. A comparison of the original December 2018 and proposed May 2020 water demands are summarized below in **Table 1**.

**Table1: Water Analysis Results Summary**

Condition	Dec 2018 Water Demands	May 2020 Water Demands	Min/Max Allowable Operating Pressures	Dec 2018 Limits of Design Operating Pressures
High Pressure	2.06	2.22 L/s	80 psi (Max)	62.2 psi
Peak Hour	11.29	12.17 L/s	40 psi (Min)	50.7 psi

Fire flow requirements will remain at 8,000 L/min as the overall building footprint is to remain as per the original December 2018 site plan submission.

The minimal increase in water demands will have negligible effects on pressures in the existing watermain system. Therefore, since the original December 2018 hydraulic analysis determined that pressures in the existing system were well above the minimum threshold there is adequate flow and pressure for the proposed unit increase.

## **SANITARY SERVICING**

There are existing 225mm and 300mm diameter sanitary sewers in Nepean Street and an existing 375mm diameter sanitary sewer in Metcalfe Street. The development is to be serviced from the existing 225mm sanitary sewer in Nepean Street as per the original design. The peak sanitary flow from the original December 2018 site plan submission was calculated to be 5.28 L/s. The peak flow with the additional units is calculated to be 5.66 L/s. The total increase in peak sanitary flow is 0.38 L/s which equates to approximately a 7% increase in flows. The downstream analysis was updated to account for the additional units and indicated no capacity constraints. Refer to **Appendix B** for detailed calculations.

Since the peak sanitary flows have only increased by 7% and the downstream analysis indicated no capacity constraints the existing downstream sanitary sewer can service to proposed unit increase.

## **CONCLUSION**

Based on the foregoing, the existing sanitary sewer and watermain infrastructure can adequately service the proposed development.

## **NOVATECH**

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															
	Unit Type				Total	Residential Demand (L/s)			Floor Area (m <sup>2</sup> )	Commercial Demand (L/s)			Total Demand (L/s)		
	Bachelor	1 Bed Apartment	1 Bed + Den Apartment	2 Bed Apartment		Avg Day	Max. Daily	Peak Hour		Avg Day	Max. Daily	Peak Hour	Avg Day	Max. Daily	Peak Hour
Unit Count	31	121	81	70	303	2.05	5.11	11.25	500.0	0.014	0.026	0.039	2.06	5.14	11.29
Unit Population	43	169	146	147	505								<b>2.06</b>	<b>5.14</b>	<b>11.29</b>

**Design Parameters:**

- Bachelor Apartment = 1.4 persons/unit
- 1 Bed Apartment = 1.4 persons/unit
- 1 Bed + Den Apartment = 1.8 persons/unit
- 2 Bed Apartment = 2.1 persons/unit

Section 4.0 Ottawa Sewer Design Guidelines

- Average Domestic Flow 350 L/person/day
- Retail Area Flow 2500 L/(1000m<sup>2</sup>/day)

Peaking Factors: Table 3-3 Moe Guideline for Drinking Water systems (pop < 500)

Max. Daily Demand:

- Residential 2.5 x Avg Day
- Commercial 1.8 x Avg Day

Peak Hourly Demand:

- Residential 2.2 xMax Day
- Commercial 1.5 xMax Day

**WATER DEMANDS FROM SITE PLAN SUBMISSION  
SERVICING AND STORMWATER MANAGEMENT REPORT DATED DECEMBER 14, 2018**

<b>Table 1 Water Demand</b>															
	Unit Type				Total	Residential Demand (L/s)			Floor Area (m <sup>2</sup> )	Commercial Demand (L/s)			Total Demand (L/s)		
	Bachelor	1 Bed Apartment	1 Bed + Den Apartment	2 Bed Apartment		Avg Day	Max. Daily	Peak Hour		Avg Day	Max. Daily	Peak Hour	Avg Day	Max. Daily	Peak Hour
Unit Count	33	90	72	116	311	2.21	5.53	12.16	117.0	0.003	0.006	0.009	2.22	5.54	12.17
Unit Population	46	126	130	244	546								<b>2.22</b>	<b>5.54</b>	<b>12.17</b>

**Design Parameters:**

- Bachelor Apartment = 1.4 persons/unit
- 1 Bed Apartment = 1.4 persons/unit
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Section 4.0 Ottawa Sewer Design Guidelines

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Max. Daily Demand:

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- Commercial 1.8 x Avg Day

Peak Hourly Demand:

- Residential 2.2 xMax Day
- Commercial 1.5 xMax Day

**WATER DEMANDS FOR PROPOSED SITE PLAN AMMENDMENT APPLICATION  
DATED, MAY 20, 2020**

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

**180 METCALFE STREET SANITARY FLOWS**

LOCATION			RESIDENTIAL								COMMERCIAL		INFILTRATION			PIPE							
AREA	FROM	TO	Apartment Units				TOTAL				Retail Floor Area (m <sup>2</sup> )	Commercial Peak Flow (L/s)	Total Area (ha)	Accum. Area (ha)	Infiltr. Flow (l/s)	Total Flow (l/s)	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	O/Q <sub>full</sub> (%)	
			Bachelor Units	1 Bed Units	1 Bed + Den Units	2 Bed Units	Pop.	Pop.	Accum. Pop.	Peak Factor													Peak Flow (l/s)
	<b>BLDG</b>	<b>EX</b>	31	121	81	70	506	506	506	3.2	5.21	500.00	0.014	0.18	0.18	0.06	5.28	200	2.00	N/a	46.3	1.48	11.4%

**Design Parameters:**

- Bachelor Apartment = 1.4 persons/unit
- 1 Bed Apartment = 1.4 persons/unit
- 1 Bed + Den Apartment = 1.8 persons/unit
- 2 Bed Apartment = 2.1 persons/unit

Section 4.0 Ottawa Sewer Design Guidelines

- Average Domestic Flow 280 L/person/day
- Retail Area Flow 2500 L/(1000m<sup>2</sup>/day)
- Extraneous Flows 0.33 l/s/ha
- Residential Peaking Factor Harmon Equation
- Commercial Peaking Factor 1

**SANITARY SEWER DESIGN SHEET FROM SITE PLAN SUBMISSION  
 SERVICING AND STORMWATER MANAGEMENT REPORT DATED DECEMBER 14, 2018**

**180 METCALFE STREET SANITARY FLOWS**

LOCATION			RESIDENTIAL									COMMERCIAL		INFILTRATION			PIPE						
AREA	FROM	TO	Apartment Units				TOTAL					Retail Floor Area (m <sup>2</sup> )	Commercial Peak Flow (L/s)	Total Area (ha)	Accum. Area (ha)	Infiltr. Flow (l/s)	Total Flow (l/s)	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q <sub>full</sub> (%)
			Bachelor Units	1 Bed Units	1 Bed + Den Units	2 Bed Units	Pop.	Pop.	Accum. Pop.	Peak Factor	Peak Flow (l/s)												
	<b>BLDG</b>	<b>EX</b>	33	90	72	116	545	545	545	3.2	5.59	117.00	0.003	0.18	0.18	0.06	5.66	200	2.00	N/a	46.3	1.48	12.2%

**Design Parameters:**

- Bachelor Apartment = 1.4 persons/unit
- 1 Bed Apartment = 1.4 persons/unit
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Section 4.0 Ottawa Sewer Design Guidelines

- Average Domestic Flow 280 L/person/day
- Retail Area Flow 2500 L/(1000m<sup>2</sup>/day)
- Extraneous Flows 0.33 l/s/ha

Residential Peaking Factor

Harmon Equation

Commercial Peaking Factor

1

**SANITARY SEWER DESIGN SHEET FOR PROPOSED SITE PLAN AMMENDMENT APPLICATION  
 DATED, MAY 20, 2020**



**180 METCALFE STREET SANITARY FLOWS**

LOCATION			RESIDENTIAL								COMMERCIAL		INFILTRATION			PIPE							
AREA	FROM	TO	Apartment Units				TOTAL				Retail Floor Area (m <sup>2</sup> )	Commercial Peak Flow (L/s)	Total Area (ha)	Accum. Area (ha)	Infiltr. Flow (l/s)	Total Flow (l/s)	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	O/Q <sub>full</sub> (%)	
			Bachelor Units	1 Bed Units	1 Bed + Den Units	2 Bed Units	Pop.	Pop.	Accum. Pop.	Peak Factor													Peak Flow (l/s)
	BLDG	MH B	31	121	81	70	506	506	506	3.2	5.21	500.00	0.014	0.18	0.18	0.06	5.28	200	2.00	N/a	46.3	1.48	11.4%
	MH B	MH D					934	934	1440	3.0	13.78			0.46	0.64	0.21	14.01	225	0.71	144.6	37.8	0.95	37.1%
	MH D	MH F					0	0	1440	3.0	13.78			0.00	0.64	0.21	14.01	300	1.58	6.5	121.4	1.72	11.5%
	MH N/S	MH F					560	560	560	3.2	5.73			0.31	0.31	0.10	5.83	N/A					
	MH F	MH I					0	0	2000	2.9	18.59			0.03	0.98	0.32	18.93	300	1.49	19.3	117.9	1.67	16.1%

**Design Parameters:**

- Bachelor Apartment = 1.4 persons/unit
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Section 4.0 Ottawa Sewer Design Guidelines

- Average Domestic Flow 280 L/person/day
- Retail Area Flow 2500 L/(1000m<sup>2</sup>/day)
- Extraneous Flows 0.33 l/s/ha

Residential Peaking Factor

Harmon Equation

Commercial Peaking Factor

1

**Notes:**

1. Site population based on proposed site plan
2. Other area populations based on maximum permitted under current zoning (except 96 Nepean population from site plan)
3. Length and slopes are approximate and taken from City of Ottawa mapping

**DOWN STREAM ANALYSIS SANITARY SEWER DESIGN SHEET FROM SITE PLAN  
 SUBMISSION SERVICING AND STORMWATER MANAGEMENT REPORT  
 DATED DECEMBER 14, 2018**

**180 METCALFE STREET SANITARY FLOWS**

LOCATION			RESIDENTIAL									COMMERCIAL		INFILTRATION			PIPE						
AREA	FROM	TO	Apartment Units				Pop.	TOTAL				Retail Floor Area (m <sup>2</sup> )	Commercial Peak Flow (L/s)	Total Area (ha)	Accum. Area (ha)	Infiltr. Flow (l/s)	Total Flow (l/s)	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q <sub>full</sub> (%)
			Bachelor Units	1 Bed Units	1 Bed + Den Units	2 Bed Units		Pop.	Accum. Pop.	Peak Factor	Peak Flow (l/s)												
	<b>BLDG</b>	<b>MH B</b>	33	90	72	116	545	545	545	3.2	5.59	117.00	0.003	0.18	0.18	0.06	5.66	200	2.00	N/a	46.3	1.48	12.2%
	<b>MH B</b>	<b>MH D</b>					934	934	1479	2.9	14.13			0.46	0.64	0.21	14.34	225	0.71	144.6	37.8	0.95	37.9%
	<b>MH D</b>	<b>MH F</b>					0	0	1479	2.9	14.13			0.00	0.64	0.21	14.34	300	1.58	6.5	121.4	1.72	11.8%
	<b>MH N/S</b>	<b>MH F</b>					560	560	560	3.2	5.73			0.31	0.31	0.10	5.83	N/A					
	<b>MH F</b>	<b>MH I</b>					0	0	2039	2.9	18.92			0.03	0.98	0.32	19.25	300	1.49	19.3	117.9	1.67	16.3%

**Design Parameters:**

- Bachelor Apartment = 1.4 persons/unit
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Section 4.0 Ottawa Sewer Design Guidelines

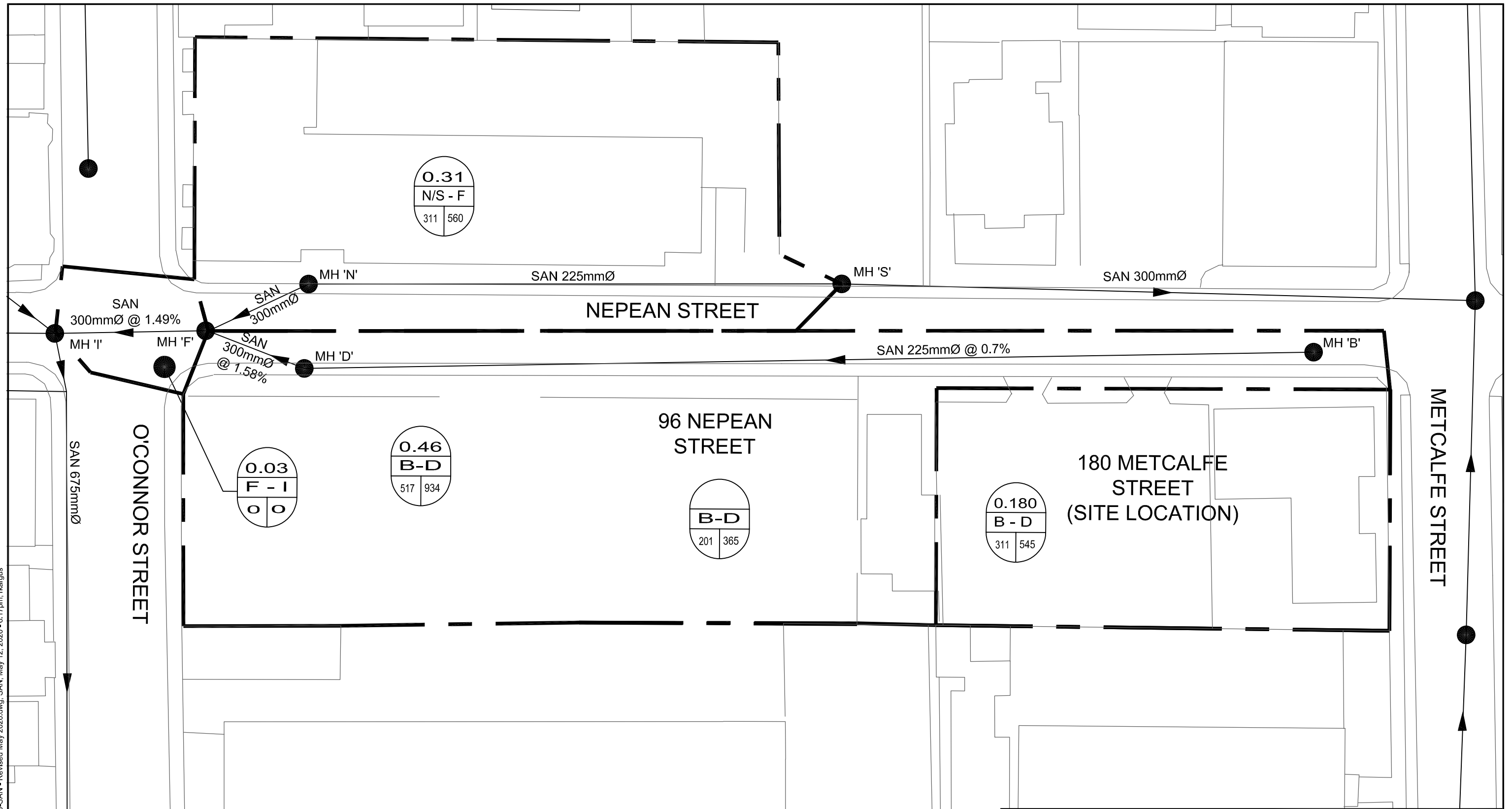
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**Notes:**

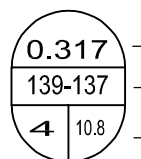
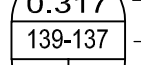
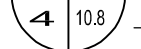
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3. Length and slopes are approximate and taken from City of Ottawa mapping





**DOWN STREAM ANALYSIS SANITARY SEWER DESIGN SHEET FOR PROPOSED SITE PLAN  
 AMMENDMENT APPLICATION DATED, MAY 20, 2020**

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**LEGEND**

-  DRAINAGE AREA (hectares)
-  MANHOLE TO MANHOLE
-  UNIT COUNT AND POPULATION

-  SANITARY DRAINAGE AREA
-  MH 100
-  DIRECTION OF FLOW
-  EXISTING SANITARY SEWER AND MANHOLE




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**180 METCALFE STREET**

**SANITARY DRAINAGE PLAN**

1 : 250 

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