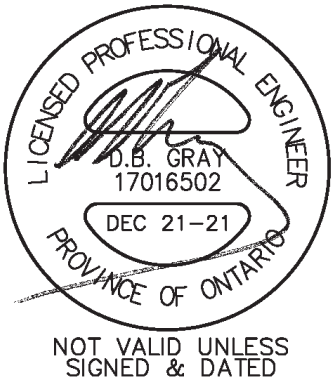
SERVICING BRIEF &
STORMWATER MANAGEMENT REPORT

197-201 Wilbrod Street
Ottawa, Ontario

Report No. 21057

December 21, 2021



D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

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SERVICING BRIEF &
STORMWATER MANAGEMENT REPORT

197-201 Wilbrod Street
Ottawa, Ontario

This report describes the services and addresses the stormwater management requirements of a property 649 sq.m in area, located at 197-201 Wilbrod Street in Ottawa. The property is currently occupied by two single-family dwellings buildings that will be demolished. A 4-storey, 20-unit apartment building is proposed.

This report forms part of the stormwater management design for the proposed development. Refer to drawings C-1 to C-4 also prepared by D.B. Gray Engineering Inc.

WATER SUPPLY FOR FIREFIGHTING:

The proposed building will have a sprinkler system with the fire department connection (FDC) located at the southwest corner of the building. There is an existing municipal fire hydrant in the Wilbrod Street right of way located approximately 40 m unobstructed distance from the proposed FDC. Since this fire hydrant is located within the maximum 45m permitted by the Ontario Building Code, an additional fire hydrant is not required.

As per Technical Bulletin ISTB-2021-03, where pipe size is not affected, the flow required for firefighting is to be calculated as per the Ontario Building Code (OBC). A fire demand of 2,700 L/min (45 L/s) at 138 kPa is required as per "Required Minimum Water Supply Flow Rate" as calculated using the Ontario Building Code - Appendix A - Article A-3.2.5.7 "Water Supply For Fire Fighting".

The boundary conditions for the 45 L/s fire flow (based on the city's computer model of the municipal water distribution system) were received from the City. They include a HGL (hydraulic grade line) of 109.4 m for the above flow rate in the 300 mm municipal watermain in Wilbrod Street at the subject property. This HGL calculates to be 390 kPa (57 psi). Since the pressure is above 138 kPa (20 psi), there is an adequate water supply for firefighting from the existing municipal water distribution system.

As per City of Ottawa Technical Bulletin ISTB-2018-02, the aggregate flow of all contributing fire hydrants within 150 m of the building can be used to supply the required fire flow. The closest hydrant is located approximately 40 m unobstructed distance from the proposed FDC. It is a Class AA fire hydrant (colour coded blue) and can contribute 5,700 L/min (95 L/s), greater than the required fire flow of 2,700 L/min (45 L/s).

WATER SERVICE:

As previously mentioned, the proposed building will have a sprinkler system. To service the sprinkler system, a 150 mm water service (connecting to the 300 mm municipal watermain in Wilbrod Street) is proposed. The 150 mm water service will be adequate for the domestic demand.

Based on Technical Bulletin ISTB-2021-03 and the City of Ottawa Water Distribution Design Guidelines (Table 4.1 & Table 4.2: 1 bedroom apartment units / 1.4 persons per unit, 2 bedroom apartment units / 2.1 persons per unit, and 280 L/person/day) and the Ministry of the Environment Design Guidelines for peaking factors (Table 3-3), the daily average demand is 0.1 L/s and the maximum daily and maximum hourly demands are 0.9 and 1.4 L/s respectively.

To determine water pressure under these demands, boundary conditions, based on the City of Ottawa computer simulation of the water distribution system at the subject property, are required. Based on the boundary conditions received from the City, the minimum HGL (hydraulic grade line) is 106.3 m and the maximum is 115.4 m. With these HGLs, the water pressure at the water meter is calculated to vary from 378 to 468 kPa (55 to 68 psi). This is an acceptable range of water pressures for the proposed development.

SANITARY SERVICE:

Based on the City of Ottawa Sewer Design Guidelines for a residential property (Technical Bulletin ISTB-2018-01, Figure 4.3: sixteen 1-bedroom apartment units / 1.4 persons per unit, four 2-bedroom apartment units / 2.1 persons per unit, and 280 L/person/day, and a 3.2 peaking factor) and based on a 0.33 L/s/ha infiltration flow, the post-development sanitary sewage flow rate is calculated to be 0.34 L/s. This flow rate will be adequately handled by the proposed sanitary service connection (150 mm at 2% - 22.47 L/s capacity) given that at the design flow rate, the service connection will only be at 2% of its capacity.

The proposed 150mm sanitary service connection will connect to the 250mm municipal sanitary sewer in Wilbrod Street, which with a 0.8% slope, has a capacity of 55.49 L/s. It is calculated that the two existing single-family dwellings generated a flow rate of 0.09 L/s. The 0.25 L/s increase in sanitary sewage flow contributing to the existing 250mm municipal sanitary sewer is expected to have an acceptable impact.

STORMWATER MANAGEMENT:

Water Quality:

The Rideau Valley Conservation Authority RVCA has stated: *"Based on the site plan provided, the RVCA will no require on-site water quality controls. Best management practices are encouraged to be integrated where possible."* As such, no permanent stormwater quality control measures are proposed.

An erosion and sediment control plan has been developed to be implemented during construction (see drawing C-2 and notes 2.1 to 2.5 on drawing C-3). To filter out construction sediment, sediment capture filter sock inserts will be installed in all existing catch-basins adjacent to the site and any material deposited on the public road will be removed.

Water Quantity:

The stormwater management criterion is to control the post-development peak flows with the use of flow control roof drains. It is calculated that the pre-development conditions reflect a 5 year runoff coefficient of 0.61. Based on a 10 minute time of concentration and the Rational Method, the pre-development flow rate is calculated to be 22.14 L/s for the 100-year event and 11.41 L/s for the 5-year event. The Modified Rational Method is used to calculate the required storage volume. The runoff coefficients for the 100-year event are increased by 25% to maximum 1.00.

Drainage Area I (Uncontrolled Flow Off Site – 335 sq.m)
Other than roof drainage, runoff from the site will be allowed to flow uncontrolled off the site. The flow is calculated at 10 minutes concentration.

	100 year event	5 year event
Maximum flow rate	10.55 L/s	5.37 L/s

Drainage Area II (Roof – 314 sq.m)
The two roof drains will be flow control type roof drains which will restrict the flow and cause the stormwater to pond on the roof. The flow control type roof drains will be installed with a parabolic slotted weir (1 slot per weir drain at 0.0124 L/s/mm/slot - 5 USgpm/inch/slot). The opening at top of the flow control weir will be a minimum 50mm in diameter. Roof drains will be Watts with an Accutrol Weir RD-100-A1 or approved equal. Four scuppers, each a minimum 230 mm wide will be installed 150 mm above the roof drains (refer to architectural for exact locations and details). The roof will be designed to carry the load of water having a 50 mm depth at the scuppers or 200 mm depth at the roof drains (refer to structural).

	100 year event	5 year event
Maximum release rate	3.50 L/s	2.63 L/s
Maximum ponding depth	141 mm	106 mm
Maximum stored volume	8.36 cu.m	3.54 cu.m

Entire Site

	100 year event	5 year event
Pre-development flow rate	22.14 L/s	11.41 L/s
Maximum release rate	14.05 L/s	8.00 L/s
Maximum stored volume	8.36 cu.m	3.54 cu.m

The maximum post-development release rate for the 100-year event is calculated to be 37% less than the pre-development flow rate. The maximum post-development release rate for the 5-year event is calculated to be 30% less than the pre-development flow rate.

The unrestricted flow rate resulting from a 5-year event will produce a peak flow of 10.55 L/s. This flow rate will be adequately handled by the proposed storm sewer system given that at the design flow rate, the last segment (250mm at 0.43% - 40.7 L/s capacity) will only be at 26% of its capacity.

The 250mm storm sewer will connect to the existing storm manhole near the south corner of the property in Wilbrod Street. The downstream 450mm municipal storm sewer, with a 0.81% slope, has a capacity of 267.7 L/s. The stormwater flow contributing to the 450 mm municipal storm sewer is expected to have a positive impact given that the flow rate is 30 to 37% less than the pre-development flow rate.

CONCLUSIONS:

1. A private onsite fire hydrant is not required.

2. There is an adequate water supply for firefighting from the existing municipal water distribution system.

3. There is an acceptable range of water pressures in the municipal watermain for the proposed development.

4. The post-development sanitary sewage flow rate will be adequately handled by the proposed sanitary service connection.

5. The increase in sanitary sewage flow contributing to the existing municipal sanitary sewer is expected to have an acceptable impact.

6. The RVCA does not require onsite water quality treatment. As such, no permanent stormwater quality control measures are proposed.

7. An erosion and sediment control plan has been developed to be implemented during construction.

8. The stormwater management criterion for quantity control is to control the post-development peak flows with the use of flow control roof drains. The maximum post-development release rate for the 100-year event is calculated to be 37% less than the pre-development flow rate. The maximum post-development release rate for the 5-year event is calculated to be 30% less than the pre-development flow rate.

9. The unrestricted flow rate resulting from a 5-year event will be adequately handled by the proposed storm sewer system.

10. The stormwater flow contributing to the 450 mm municipal storm sewer in Wilbrod Street is expected to have a positive impact given that the flow rate is 30 to 37% less than the pre-development flow rate.

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21-Dec-21

197-201 Wilbrod Street
Ottawa, Ontario

Proposed Apartment Building

Water Supply for Fire-Fighting Calculations:

As per "Required Minimum Water Supply Flow Rate" as calculated using the Ontario Building Code - Appendix A - Article A-3.2.5.7 "Water Supply For Fire Fighting".

Fire Protection Water Supply $Q = KVS_{Tot}$

$S_{Tot} = 1.0 + S_{Side1} + S_{Side2} + S_{Side3} + S_{Side1} + S_{Side4}$

	Spatial Coefficient	Exposure Distance m	
S_{Side1}	0.24	7.6	(to north property line)
S_{Side2}	0.50	1.7	(to east property line)
S_{Side3}	0.00	11	(to center line of road)
S_{Side4}	0.50	1.7	(to west property line)
	2.24		
S_{Tot}	2	Need not exceed 2	

K (Water Supply Coefficient)

10 As per A-3.2.5.7. Table 1 (Group C Occupancy / Combustible construction with fire separations without fire resistance ratings)

V (Building Volume)

	Area sq.m.	Height m	Volume cu.m.
4th Floor	314	2.90	911
3rd Floor	346	2.90	1003
2nd Floor	346	2.90	1003
1st Floor	346	2.90	1003
			3921

$Q = KVS_{Tot}$

$Q_2 =$ 78,416 L

Required Minimum Water Supply Flow Rate 2,700 L/min 45 L/sec
(As per A-3.2.5.7. Table 2)

Elevation at Fire Hydrant: 69.65 m ASL

Static Pressure at Fire Hydrant

45 L/s FIRE FLOW: 109.4 m ASL 57 psi 390 kPa

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21-Dec-21

197-201 Wilbrod Street
4 Storey Apartment Building
20 Apartment Units
Ottawa, Ontario

Water Demand

	Number of Units	Persons Per Unit	Population
1 Bedroom:	16	1.4	22
2 Bedroom:	4	2.1	8
3 Bedroom:	0	3.1	0
Average Apartment:	0	1.8	0
TOTAL:	20		31

DAILY AVERAGE:	280	litres / person / day				
	6.0	L/min	0.1	L/s	1.6	USgpm
MAXIMUM DAILY DEMAND:	9.5	(Peaking Factor for a equivalent population of 31: Table 3-3 MOE Design Guidelines for Drinking-Water Systems)				
	56.7	L/min	0.9	L/s	15	USgpm
MAXIMUM HOURLY DEMAND:	14.3	(Peaking Factor for a equivalent population of 31: Table 3-3 MOE Design Guidelines for Drinking-Water Systems)				
	85.4	L/min	1.4	L/s	23	USgpm

			Static Pressure at Water Meter			
Elevation of Water Meter:	67.70	m ASL				
Finish Floor Elevation:	66.80	m ASL				
MINIMUM HGL:	106.3	m ASL	55	psi	378	kPa
MAXIMUM HGL:	115.4	m ASL	68	psi	468	kPa

D.B. Gray Engineering Inc.

Ryan Faith <r.faith@dbgrayengineering.com>

RE: FW: Request for Boundary Conditions - 197-201 Wilbrod Street

1 message

Jhamb, Nishant <nishant.jhamb@ottawa.ca> Tue, Dec 21, 2021 at 9:52 AM
To: Ryan Faith <r.faith@dbgrayengineering.com>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>

Hello Ryan

The following are boundary conditions, HGL, for hydraulic analysis at 197-201 Wilbrod Street (zone 1W) assumed to be connected to the 305 mm watermain on Wilbrod Street (see attached PDF for location).

Minimum HGL: 106.3 m

Maximum HGL: 115.4 m

Max Day + FF (45 L/s): 109.4 m

Max Day + FF (60 L/s): 109.3 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.

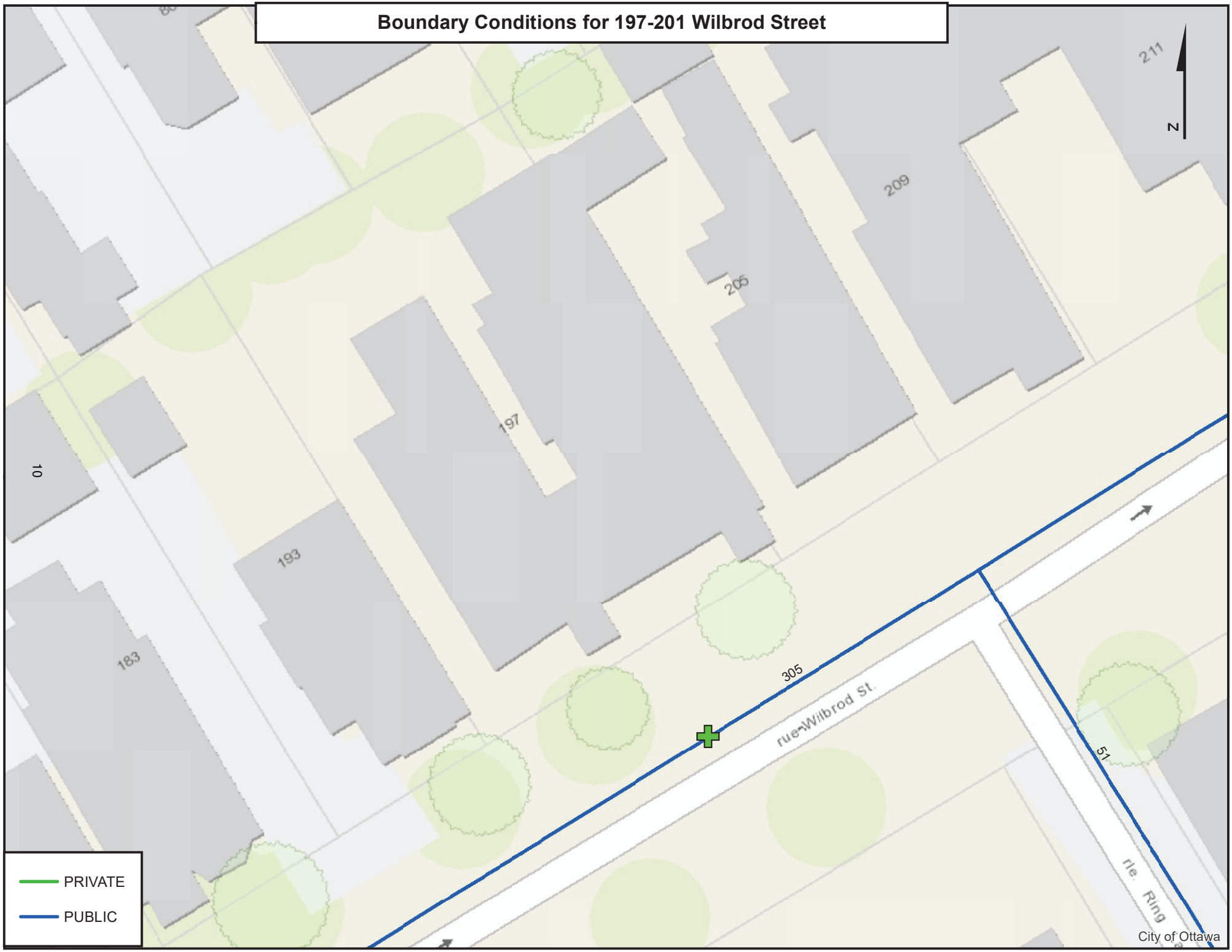
Thanks

Nishant

From: Ryan Faith <r.faith@dbgrayengineering.com>
Sent: December 17, 2021 9:15 AM
To: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: Re: FW: Request for Boundary Conditions - 197-201 Wilbrod Street

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

Boundary Conditions for 197-201 Wilbrod Street



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SANITARY SEWER DESIGN FORM

Average Daily Flows

Residential:	280	L / capita / day
Commercial:	28000	L / ha / day
Institutional:	28000	L / ha / day
Light Industrial:	35000	L / ha / day
Heavy Industrial:	55000	L / ha / day

Infiltration Allowance: 0.33 l / s / ha

Peaking Factor:

Residential (Harmon Equation): $1 + \frac{14}{4 + P^{0.5}}$

P = Population / 1000

Harmon Correction Factor: 0.8

Commercial & Institutional: 1.5 If contrinbution > 20%

Commercial & Institutional: 1 If contrinbution < 20%

Industrial: As per Ottawa Guidelines Appendix 4-B

Project: 197-201 Wilbrod Street

Designed By: D.B.G

December 21, 2021

Page: 1 of 1

n = 0.013

Location		Section								Cumulative Residential		Section Non-Residential			Cumulative					Sewer Data							
		Single Family ppu = 3.4	Semi / Townhouse ppu = 2.7	Duplex / Triplex ppu = 2.3	Apartment (average) ppu = 1.8	Apartment (1 Bed) ppu = 1.4	Apartment (2 Bed) ppu = 2.1	Apartment (3 Bed) ppu = 3.1	Area			Area	Flow	Peaking	Flow	Area	Sewage Flow	Infiltration Flow	Total Flow		Actual Diameter	Nominal Diameter	Slope	Length	Capacity	Velocity	Ratio
From	To	No. of Units	No. of Units	No. of Units	No. of Units	No. of Units	No. of Units	No. of Units	(ha)	Pop.	Peaking Factor	(ha)	(L/ha/day)	Factor	(L/s)	(ha)	(L/s)	(L/s)	(L/s)	Material	(mm)	(mm)	(%)	(m)	(L/s)	(m/s)	Q/Qfull
		2 - Existing Single Family Dwellings																									
#197	Existing 250 SAN	1							0.03245	3.4	3.20					0.03245	0.04	0.01	0.05	PVC	135.0	135	1.00	13	11.50	0.80	0.00
#201	Existing 250 SAN	1							0.03245	3.4	3.20					0.03245	0.04	0.01	0.05	PVC	135.0	135	1.00	13	11.50	0.80	0.00
																		Total Flow	0.09							
		Proposed Apartment Building																									
Proposed Building	Existing 250 SAN					16	4		0.0649	30.8	3.20					0.0649	0.32	0.02	0.34	PVC	152.4	150	2.00	12.5	22.47	1.23	0.02
																					Existing 250 SAN in Wilbrod Street						
																					254.0	250	0.80		55.49	1.10	

D.B. Gray Engineering Inc.

Ryan Faith <r.faith@dbgrayengineering.com>

RE: RVCA Stormwater Management Comments - 197-201 Wilbrod Street

1 message

Eric Lalande <eric.lalande@rvca.ca> Tue, Dec 14, 2021 at 11:27 AM
To: Ryan Faith <r.faith@dbgrayengineering.com>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>

Hi Ryan,

Based on the site plan provided, the RVCA will no require on-site water quality controls. Best management practices are encouraged to be integrated where possible.

Thank you,

Eric Lalande, MCIP, RPP

Planner, RVCA

613-692-3571 x1137

From: Ryan Faith <r.faith@dbgrayengineering.com>
Sent: Tuesday, December 14, 2021 11:26 AM
To: Eric Lalande <eric.lalande@rvca.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: RVCA Stormwater Management Comments - 197-201 Wilbrod Street

Hi Eric,

We are working on a proposed 4 storey apartment building on 649 sq.m of land at 197-201 Wilbrod Street in Ottawa.

Please comment on the stormwater management for the site.

I have attached a site plan for your reference.

Thanks,

Ryan Faith

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STORMWATER MANAGEMENT CALCULATIONS

Flow control roof drain calculations are based on the following formula:

$$Q = N \times S \times d \times F$$

where:

Q = flowrate in litres per second
N = number of roof drains
S = slots per weir
d = pond depth at roof drain in mm
F = flowrate through each slot
0.0124 litres per second per mm pond depth (5 USgpm per inch)

Storage calculations on the roof area are based on the following formula for volume of a cone:

$$V = A \times d / 3$$

where:

V = volume in cu.m.
A = ponding area in sq.m.
d = ponding depth in meters

Summary Tables

ONE HUNDRED-YEAR EVENT				
Drainage Area	Pre-Development Flow Rate (L/s)	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	10.55	-	-
AREA II (Roof)	-	3.50	8.36	8.36
TOTAL	22.14	14.05	8.36	8.36

FIVE-YEAR EVENT				
Drainage Area	Pre-Development Flow Rate (L/s)	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	5.37	-	-
AREA II (Roof)	-	2.63	3.54	3.54
TOTAL	11.41	8.00	3.54	3.54

197-201 Wilbrod Street

Ottawa, Ontario

STORMWATER MANAGEMENT CALCULATIONS
Rational Method

PRE-DEVELOPMENT CONDITIONS

100-Year Flow Rate

			C
Roof Area:	340	sq.m	1.00
Asphalt/Concrete Area:	30	sq.m	1.00
Gravel Area:	10	sq.m	0.875
Landscaped Area:	269	sq.m	0.25
Total Catchment Area:	649	sq.m	0.69
Area (A):	649	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr	
Runoff Coeficient (C):	0.69		
100 Year Pre-Development Flow Rate (2.78AiC):	22.14	L/s	

5-Year Flow Rate

			C
Roof Area:	340	sq.m	0.90
Asphalt/Concrete Area:	30	sq.m	0.90
Gravel Area:	10	sq.m	0.70
Landscaped Area:	269	sq.m	0.20
Total Catchment Area:	649	sq.m	0.61
Area (A):	649	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	104	mm/hr	
Runoff Coeficient (C):	0.61		
5 Year Pre-Development Flow Rate (2.78AiC):	11.41	L/s	

ONE HUNDRED-YEAR EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(ONE HUNDRED-YEAR EVENT)

			C
Roof Area:	35	sq.m	1.00
Asphalt/Concrete Area:	120	sq.m	1.00
Gravel Area:	20	sq.m	0.875
Landscaped Area:	160	sq.m	0.25
Total Catchment Area:	335	sq.m	0.63
Area (A):	335	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr	
Runoff Coeficient (C):	0.63		
Flow Rate (2.78AiC):	10.55	L/s	

DRAINAGE AREA II (Roof)

(ONE HUNDRED-YEAR EVENT)

			C
Total Catchment Area:	314	sq.m	1.00

No. of Roof Drains:	2	
Slots per Wier:	1	0.0124 L/s/mm/slot (5 USGPM/in/slot)
Depth at Roof Drain:	141	mm
Maximum Release Rate:	3.50	L/s

Pond Area:	177	sq.m
Achieved Volume:	8.36	cu.m
Maximum Volume Required:	8.36	cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Stored Volume (cu.m)
5	243	21.19	3.50	17.68	5.30
10	179	15.59	3.50	12.08	7.25
15	143	12.47	3.50	8.97	8.07
20	120	10.47	3.50	6.97	8.36
25	104	9.07	3.50	5.56	8.34
30	92	8.02	3.50	4.52	8.13
35	83	7.21	3.50	3.70	7.78
40	75	6.56	3.50	3.06	7.33
45	69	6.03	3.50	2.52	6.81
50	64	5.58	3.50	2.08	6.24
55	60	5.20	3.50	1.70	5.61
60	56	4.88	3.50	1.37	4.95
65	53	4.60	3.50	1.09	4.26
70	50	4.35	3.50	0.84	3.54
75	47	4.13	3.50	0.62	2.79
80	45	3.93	3.50	0.42	2.03
85	43	3.75	3.50	0.25	1.25
90	41	3.59	3.50	0.08	0.46
95	39	3.44	3.44	0.00	0.00
100	38	3.31	3.31	0.00	0.00
105	36	3.19	3.19	0.00	0.00
110	35	3.07	3.07	0.00	0.00
115	34	2.97	2.97	0.00	0.00
120	33	2.87	2.87	0.00	0.00

FIVE-YEAR EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(FIVE-YEAR EVENT)

			C
Roof Area:	35	sq.m	0.90
Asphalt/Concrete Area:	120	sq.m	0.90
Gravel Area:	20	sq.m	0.70
Landscaped Area:	160	sq.m	0.20
Total Catchment Area:	335	sq.m	0.55

Area (A):	335	sq.m
Time of Concentration:	10	min
Rainfall Intensity (i):	104	mm/hr
Runoff Coeficient (C):	0.55	
Flow Rate (2.78AiC):	5.37	L/s

DRAINAGE AREA II (Roof)

(FIVE-YEAR EVENT)

			C
Total Catchment Area:	314	sq.m	0.90

No. of Roof Drains:	2	
Slots per Wier:	1	0.0124 L/s/mm/slot (5 USGPM/in/slot)
Depth at Roof Drain:	106	mm
Maximum Release Rate:	2.63	L/s

Pond Area:	100	sq.m
Achieved Volume:	3.54	cu.m
Maximum Volume Required:	3.54	cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Stored Volume (cu.m)
5	141	11.09	2.63	8.46	2.54
10	104	8.19	2.63	5.55	3.33
15	84	6.56	2.63	3.93	3.54
20	70	5.52	2.63	2.89	3.47
25	61	4.78	2.63	2.15	3.23
30	54	4.24	2.63	1.61	2.89
35	49	3.81	2.63	1.18	2.48
40	44	3.47	2.63	0.84	2.02
45	41	3.19	2.63	0.56	1.51
50	38	2.96	2.63	0.33	0.98
55	35	2.76	2.63	0.13	0.42
60	33	2.59	2.59	0.00	0.00
65	31	2.44	2.44	0.00	0.00
70	29	2.31	2.31	0.00	0.00
75	28	2.19	2.19	0.00	0.00
80	27	2.09	2.09	0.00	0.00
85	25	1.99	1.99	0.00	0.00
90	24	1.91	1.91	0.00	0.00
95	23	1.83	1.83	0.00	0.00
100	22	1.76	1.76	0.00	0.00
105	22	1.70	1.70	0.00	0.00
110	21	1.64	1.64	0.00	0.00
115	20	1.58	1.58	0.00	0.00
120	19	1.53	1.53	0.00	0.00

City of Ottawa Servicing Study Checklist

General Content

Executive Summary (for large reports only): not applicable

Date and revision number of the report: included

Location map and plan showing municipal address, boundary, and layout of proposed development: included

Plan showing the site and location of all existing services: included

Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere: not applicable

Summary of Pre-consultation Meetings with City and other approval agencies: included

Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria: not applicable

Statement of objectives and servicing criteria: included

Identification of existing and proposed infrastructure available in the immediate area: included

Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available): included

Concept level master grading plan to confirm existing and proposed grades in the development and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths: not applicable

Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts: not applicable

Proposed phasing of the development, if applicable: not applicable

Reference to geotechnical studies and recommendations concerning servicing: included

All preliminary and formal site plan submissions should have the following information:

- **Metric scale:** included
- **North arrow:** included
    - **(including construction North):** not applicable
- **Key Plan:** included
- **Name and contact information of applicant and property owner:** not available
- **Property limits**: included
    - **including bearings and dimensions:** not included
- **Existing and proposed structures and parking areas:** included

- **Easements, road widening and rights-of-way:** included
- **Adjacent street names:** included

Development Servicing Report: Water

Confirm consistency with Master Servicing Study, if available: not applicable

Availability of public infrastructure to service proposed development: included

Identification of system constraints: included

Confirmation of adequate domestic supply and pressure: included

Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow locations throughout the development: included

Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves: included

Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design: not applicable

Address reliability requirements such as appropriate location of shut-off valves: not applicable

Check on the necessity of a pressure zone boundary modification: not applicable

Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range: not applicable

Description of the proposed water distribution network, including locations of proposed connections to the existing systems, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions: not applicable

Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation: not applicable

Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines: included

Provision of a model schematic showing the boundary conditions locations, streets , parcels, and building locations for reference: not applicable

Development Servicing Report: Wastewater

Summary of proposed design criteria: included

(Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure): not applicable

Confirm consistency with Master Servicing Study and /or justification for deviations: not applicable

Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and conditions of sewers: not applicable

Descriptions of existing sanitary sewer available for discharge of wastewater from proposed development: included

Verify available capacity in downstream sanitary sewer and / or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable): not applicable

Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix C) format: included

Description of proposed sewer network including sewers, pumping stations, and forcemains: included

Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality): not applicable

Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development: not applicable

Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity: not applicable

Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding: not applicable

Special considerations such as contamination, corrosive environment etc: not applicable

Development Servicing Report: Stormwater Checklist

Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property): included

Analysis of available capacity in existing public infrastructure: not applicable

A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern: included

Water quality control objective (e/g/ controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects: included

Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements: included

Descriptions of the references and supporting information.
Set-back from private sewage disposal systems: not applicable

Watercourse and hazard lands setbacks: not applicable

Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed: included

Confirm consistency with sub-waterched and Master Servicing Study, if applicable study exists: not applicable

Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period): included

Identification of watercourses within the proposed development and how watercourses will be protected, or , if necessary, altered by the proposed development with applicable approvals: included

Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions: included

Any proposed diversion of drainage catchment areas from one outlet to another: not applicable

Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities: not applicable

If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event: not applicable

Identification of potential impacts to receiving watercourses: included

Identification of municipal drains and related approval requirements: not applicable

Descriptions of how the conveyance and storage capacity will be achieved for the development: included

100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading:

Inclusion of hydraulic analysis including hydraulic grade line elevations: not applicable

Description of approach to erosion and sediment control during construction for the protection of receiving watercourses of drainage corridors: included

Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplains elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current: not applicable

Identification of fill constraints related to floodplain and geotechnical investigation: not applicable

Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act: not applicable

Application for Certificate of Approval (CofA) under the Ontario Water Resources Act:

Changes to Municipal Drains: not applicable

Other permits (National Capital commission, Parks Canada, public Works and Government Services Canada, Ministry of transportation etc.): not applicable

Conclusion Checklist

Clearly stated conclusions and recommendations: included

Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency:

All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario: included