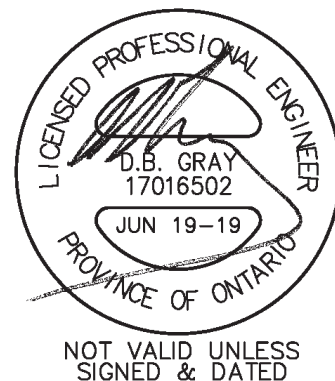


# ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES AND STORM WATER MANAGEMENT BRIEF

Lux Place  
1098 Ogilvie Road & 1178 Cummings Avenue  
Ottawa, Ontario

Report No. 18019

June 19, 2019



## D. B. GRAY ENGINEERING INC.

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# ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES AND STORM WATER MANAGEMENT BRIEF

Lux Place  
1098 Ogilvie Road & 1178 Cummings Avenue  
Ottawa, Ontario

Lux Place is a proposed hotel / residential development on 1.54 hectares of land located at the south-west corner of the Ogilvie Road / Cummings Avenue intersection in City of Ottawa. The land is currently undeveloped and is covered with grass, brush and a wooded area. Specifically, the proposed development includes 25 & 27-storey residential apartment towers connected by a 6-storey podium; a 36-storey residential apartment tower and an 8-storey 187-room hotel connected by a one-storey loading area; and all connected by ground floor commercial and underground parking.

This report is a description of the local public services (watermains and sanitary and storm sewers) and an assessment of their adequacy to serve the proposed development. This report also addresses stormwater management requirements for the proposed development.

## WATER SUPPLY FOR FIREFIGHTING:

The proposed building will be installed with a sprinkler system. There is an existing municipal fire hydrant in the Cummings Avenue road right-of-way located on the opposite side of the road and connecting to a 305mm municipal watermain. (There is also a 610mm watermain in Ogilvie Road.) There is roughly a 34m straight-line-distance from this hydrant to the east façade of the proposed building. It is expected that the fire department connection (FDC) serving the sprinkler system can be located less than a 45m-unobstructed-distance from the existing fire hydrant. Therefore it is expected that a private on-site fire hydrant will not be required. However, if the FDC is greater than 45m from the existing municipal hydrant, a private fire hydrant could be installed within the subject development.

The City of Ottawa requires that the flow required for firefighting be determined using the Fire Underwriter Survey (FUS) "Water Supply For Fire Protection" method. The proposed development is divided into two fire areas. A fire flow of 417 L/s (25,000 L/min) is required for the 25-27 storey apartment towers / 6-storey podium. For the 36-storey apartment tower / 8-storey hotel the required fire flow is 300 L/s (18,000 L/min). To determine water pressure under these demands, "boundary conditions", based on the City of Ottawa computer simulation of the municipal water distribution system, at the subject location, are required. Since 417 l/s is a relatively high flow rate and since it can take several weeks to receive boundary conditions from the City, the required fire flow was also calculated assuming the 25-27 storey apartment towers / 6-storey podium was divided by a 2-hour-rated firewall. The fire flow for the portion of the building west of the

fire wall is calculated to be 333 L/s (20,000 L/min). East of the firewall it is 283 L/s (17,000 L/min).

In summary, we requested four sets of fire flow boundary conditions based on fire flows of 417 L/s and 333 L/s connecting to either the 610mm diameter municipal watermain in Ogilvie Road or the 305mm in Cummings Avenue.

The City provided four sets of fire flow boundary conditions / HGLs (hydraulic grade lines). From the HGLs the pressures can be calculated. The HGLs and calculated pressures are as follows:

	HGL	Pressure
417 L/s Fire Flow (from the 610mm on Ogilvie)	109.0m	56 psi (386 kPa)
417 L/s Fire Flow (from the 305mm on Cummings)	102.5m	47 psi (327 kPa)
333 L/s Fire Flow (from the 610mm on Ogilvie)	110.0m	57 psi (396 kPa)
333 L/s Fire Flow (from the 305mm on Cummings)	106.0m	52 psi (361 kPa)

Since, in all cases, the pressures are above 138 kPa (20 psi) there is an adequate water supply for firefighting for the proposed development and 2-hour firewalls will not be required.

#### WATER SERVICE:

The 850 apartment units are proposed. Based on the City of Ottawa Water Distribution Design Guidelines for residential properties (1.8 person per average apartment unit and 350 L/person/day) the daily average flow is 6.2 L/s. Based on the and Ministry of the Environment Design Guidelines' peaking factors and a population of 1530 (850 units x 1.8/unit) maximum daily and maximum hourly demands are 15.5 and 34.1 L/s, respectively.

Based on Appendix 4-A of the City of Ottawa Sewer Design Guidelines the daily average consumption rate for hotels is 225 L/room. Based on this rate and a 12-hour day the daily average demand is calculated to be 1.0 L/s. Based on the City guidelines the maximum daily peaking factor is 1.5 of the daily average demand and maximum hourly peaking factor is 1.8 of the maximum daily demand. Based on these peaking factors the maximum daily demand for the hotel is 1.5 L/s and maximum hourly demand is 2.6 L/s.

Based on the City of Ottawa Design Guidelines the daily average consumption rate for a commercial development is 28,000 litres per day per hectare. The maximum daily peaking factors is 1.5 of the daily average demand and maximum hourly peaking factor is 1.8 of the maximum daily demand. Based on this rate and assuming a 12-hour day,

the maximum daily demand is calculated to be 1.0 L/s. Based on the peaking factors the maximum daily demand is 1.5 L/s and maximum hourly demand is 2.7 L/s.

Therefore the total daily average flow (the sum of residential + hotel + commercial) is 8.2 L/s, with a maximum daily and maximum hourly demands of 18.5 and 39.4 L/s, respectively. Boundary conditions were requested for these demands.

The City provided two sets of boundary conditions / HGLs. From the HGLs the pressures can be calculated. The HGLs and the calculated pressures (based on an estimated the proposed water meter having an elevation of 69.90m) are as follows:

	HGL	Pressure
Minimum (from either watermain)	109.7m	57 psi (390 kPa)
Maximum (from either watermain)	118.0m	68 psi (472 kPa)

As per the City of Ottawa Water Distribution Design Guidelines the desired pressure range is from 50 to 80 psi, with a minimum of 40 psi under the maximum hourly demand conditions. Therefore, since the water pressure is calculated to vary from 57 to 68 psi, an acceptable range of pressures is available for the proposed development.

As per the City of Ottawa Water Distribution Design Guidelines areas with a daily demand greater than 50 m<sup>3</sup> / day (0.58 L/s) requires two connections. Therefore, with an average daily flow of 8.2 L/s, two connections will be required for the proposed development. One service will connect to the 610mm watermain in Ogilvie Road and the other to the 305mm watermain in Cummings Avenue.

As previously mentioned the proposed buildings will have a sprinkler system. To service the sprinkler system 150 mm water services are proposed. The two 150mm services will be adequate for the domestic demand.

#### SANITARY SERVICE:

Based on the City of Ottawa Sewer Design Guidelines for residential properties (1.8 person per average apartment unit – 280 l/person/day – and a Harmon Equation calculated peaking factor of 2.94); and based on Appendix 4-A of the Ottawa Guidelines for hotels (225 L/room x 187 rooms); and based on the Ottawa Guidelines for a commercial property (28,000 l/ ha / day – 1.5 peaking factor x 2 for 12-hour day); and based on a 0.33 l/s/ha infiltration flow; the post development flow is calculated to be 18.04 L/s.

This flow will be adequately handled by a proposed sanitary sewer service connection (200mm at 1% - 34.2 l/s capacity) since, at the design peak flow, it will only be 53% full. It is proposed that the sanitary service will connect to an existing 250mm municipal sanitary sewer in Cummings Avenue. This municipal sewer is approximately 2.2m deep

and therefore it is at an adequate depth so that the sewage generated by the proposed development can drain by gravity (with the possible exception of plumbing fixtures in the underground parking which may be required, as is typically the case, to drain to a sump and be pumped).

The 250mm municipal sanitary sewer (with a 0.29% slope) in Cummings Avenue currently only serves an existing 160-unit residential apartment building on Cummings across the road from the subject development. Based on the City of Ottawa Sewer Design Guidelines for residential properties (1.8 person per average apartment unit – 280 l/person/day – a peaking factor of 3.2); and based on a 0.33 l/s/ha infiltration flow and an area of 2.08 ha (including the road R.O.W.); the current peak design sewage flow is calculated to be 3.67 L/s.

The subject development will increase the peak flow in the 250mm municipal sewer in Cummings Avenue to 21.36 L/s. Having a capacity of 33.7 L/s, this flow will be adequately handled by the existing 250mm municipal sewer, which post development will only be 63% full.

#### STORMWATER MANAGEMENT:

##### Water Quality:

Since runoff from most of the proposed development will be from roofs; the ground level podium roof; or landscaped areas; it is anticipated that most of the runoff from the development will be considered “clean” and permanent quality control measures will not be required. However, if the Rideau Valley Conservation Authority (RVCA) requires quality control to achieve TSS (total suspended solids) removal; an oil/grit separator (OGS) manhole can be installed.

An erosion and sediment control plan will be developed to be implemented during construction.

##### Water Quantity:

The stormwater management criteria for quantity control are to control the post development peak flows for the 5-year and 100-year storm events to peak flows during the 5-year storm event using a pre-development runoff coefficient or runoff coefficient of 0.50, whichever is less; and a calculated time of concentration (but not less than 10 minutes). It is calculated that the pre-development conditions reflect a 5-year runoff coefficient of 0.30 and, based on the Airport Formula, a time of concentration of 21 minutes. Therefore, using the Rational Method, the maximum allowable release rate is 87.7 L/s for all storm events. The runoff coefficients for the 100 year event are increased by 25% to maximum 1.00.

It is estimated that the stormwater management design for proposed development will be able to control all but approximately 0.26 ha of the 1.54 ha site.

During the 100-year storm event, based on an estimated runoff coefficient of 0.40 the uncontrolled flow of the site (Drainage Area I in the calculations) is calculated to be 52.3 L/s (at 10 minutes concentration).

To control the flow off the site to the maximum permitted of 87.7 L/s the flow from the remainder of the site (Drainage Area II) has to be restricted to 35.5 L/s (= 87.7 – 52.3 L/s). This can be achieved by using flow control roof drains and inlet control devices (ICDs – located at the outlet pipe of manhole(s)). A flow control roof drains will restrict the flow cause water to be stored on the roof. An ICD will restrict the flow in a sewer and force the stormwater to back up onto storage. Restricting the flow to 35.5 L/s (and therefore achieving the maximum allowable of 87.7 L/s) it is calculated that the total required maximum stored volume is 478 m<sup>3</sup>. While some of this volume may be stored on the roofs, it is expected that an underground cistern and /or basement tank will be required to store most of this volume.

Stormwater released through the flow control roof drains and ICDs will be conveyed off the site via a storm sewer connection connecting a proposed municipal storm sewer in Cummings Avenue which will connect to an existing 1950mm storm sewer located to the south of the property. The proposed municipal storm sewer (and possibly the stormwater management design) will require a Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA).

The subject property currently drains south to ditches and catch basins draining to the 1950mm storm sewer. Since the post development flows up to 100-year event are restricted to the 5-year pre-development runoff it is expected that the proposed development will have an acceptable impact on the municipal storm sewers.

## CONCLUSIONS:

1. It is expected that a private on-site fire hydrant will not be required.
2. There will be an adequate water supply for firefighting.
3. The proposed water service connections will be adequately sized to serve the development.
4. The existing water pressure in the municipal watermain is adequate for the proposed development.
5. The expected sanitary sewage flow rate will be adequately handled by a proposed sanitary sewer service connection.
6. The sanitary flow contributing to the existing municipal sanitary sewer is expected to have an acceptable impact.
7. Quality control measures may not be required; however, if RVCA requires quality control an oil/grit separator (OGS) manhole can be installed.
8. An erosion and sediment control plan will be developed to be implemented during construction.
9. The stormwater management criteria for quantity control requires a maximum post-development release rate, for up to the 100-year storm event, of 87.7 L/s. Restricting to this maximum release rate, the maximum stored volume is calculated to be 478 m<sup>3</sup>.
10. The restricted stormwater flow contributing to the existing municipal storm sewer is expected to have an acceptable impact.
11. The proposed municipal storm sewer (and possibly the stormwater management design) will require an ECA from MECP.

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27-May-19

REVISED 10-Jun-19

1098 Ogilvie Road & 1178 Cummings Avenue  
Ottawa, Ontario

## Fire Flow Requirements

### Proposed 25 Storey + 27 Storey Apartment Buildings + 6 Storey Podium

Fire flow requirement as calculated as per Fire Underwriter Survey "Water Supply For Fire Protection".

$F = 220 C A^{0.5}$  = the required fire flow in litres per minute

C = coefficient related to the type of construction  
= 0.8 Non-Combustible Construction (Unprotected structural components)

A = total floor area (all storeys excluding basements at least 50% below grade)

**Please refer to Appendix "A" for complete area breakdown**

TOTAL FIRE AREA: 46,966 sq.m.

F = 38,142 L/min  
= 38,000 L/min (rounded off to the nearest 1,000 L/min)

-15% Charge for Combustible Occupancy

= 32,300 L/min

50% Reduction for Sprinkler System

= 16,150 L/min

Increase for Separation Exposed Buildings

				Adjacent Building		Length- Height Factor
				Construction	Length m	
0%	North	>45m				0
0%	East	>45m				0
15%	South	10.1 to 20m	N-C	69	36	2484
12%	West	10.1 to 20m	N-C	27	1	27
27%	Total Increase for Exposure (maximum 75%)					
=	8,721	L/min Increase				
=	24,871	L/min				
F =	25,000	L/min (rounded off to the nearest 1,000 L/min)				
=	416.7	l/s				

Approx. Elevation at Fire Hydrant (Existing on Ogilvie )	69.60	m ASL	Static Pressure at Fire Hydrant		
417 l/s FIRE FLOW:	109.0	m ASL	56	psi	386 kPa
Elevation at Fire Hydrant: (Existing on Cummings)	69.16	m ASL	Static Pressure at Fire Hydrant		
417 l/s FIRE FLOW:	102.5	m ASL	47	psi	327 kPa



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Proposed 25 Storey + 27 Storey Apartment Buildings + 6 Storey Podium

## Appendix "A"

ALL AREAS IN SQ.M

### Tower 1 (West - 25 Storeys)

### Podium (6 Storeys)

### Tower 2 (East- 27 Storeys)

25th Floor	631			27th Floor	631
24th Floor	631			26th Floor	631
23rd Floor	810			25th Floor	810
22nd Floor	810			24th Floor	810
21st Floor	810			23rd Floor	810
20th Floor	810			22nd Floor	810
19th Floor	810			21st Floor	810
18th Floor	810			20th Floor	810
17th Floor	810			19th Floor	810
16th Floor	810			18th Floor	810
15th Floor	810			17th Floor	810
14th Floor	810			16th Floor	810
13th Floor	810			15th Floor	810
12th Floor	810			14th Floor	810
11th Floor	810			13th Floor	810
10th Floor	810			12th Floor	810
9th Floor	810			11th Floor	810
8th Floor	810			10th Floor	810
7th Floor	810			9th Floor	810
6th Floor	863	6th Floor	839	8th Floor	810
5th Floor	863	5th Floor	839	7th Floor	810
4th Floor	863	4th Floor	839	6th Floor	810
3rd Floor	863	3rd Floor	839	5th Floor	810
2nd Floor	863	2nd Floor	839	4th Floor	810
1st Floor	863	1st Floor	839	3rd Floor	880
				2nd Floor	880
				1st Floor	880

SUM 20210 sq.m

5034 sq.m

21722 sq.m

TOTAL FIRE AREA 46966 sq.m

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## Fire Flow Requirements

### Proposed 36 Storey Apartment Building + 8 Storey Hotel

Fire flow requirement as calculated as per Fire Underwriter Survey "Water Supply For Fire Protection".

$F = 220 C A^{0.5}$  = the required fire flow in litres per minute

C = coefficient related to the type of construction  
= 0.8 Non-Combustible Construction (Unprotected structural components)

A = total floor area (all storeys excluding basements at least 50% below grade)

*Please refer to Appendix "B" for complete area breakdown*

TOTAL FIRE AREA: 34,134 sq.m.

F = 32,517 L/min  
= 33,000 L/min (rounded off to the nearest 1,000 L/min)

-15% Charge for Combustible Occupancy

= 28,050 L/min

50% Reduction for Sprinkler System

= 14,025 L/min

Increase for Separation Exposed Buildings

			Adjacent Building		Length- Height Factor
		Constuction	Length m	Storeys	
15% North	10.1 to 20m	N-C	69	27	1863
0% East	>45	N-C			0
0% South	>45	N-C			0
0% West	>45	N-C			0
15% Total Increase for Exposure (maximum 75%)					
=	4,208	L/min Increase			
=	18,233	L/min			
F =	18,000	L/min (rounded off to the nearest 1,000 L/min)			
=	300.0	l/s			

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Proposed 36 Storey Apartment Building + 8 Storey Hotel

## Appendix "B"

### ALL AREAS IN SQ.M

#### Tower 3 (36 Storeys)

#### Hotel (8 Storeys)

36th Floor	646		
35th Floor	646		
34th Floor	646		
33rd Floor	646		
32nd Floor	646		
31st Floor	646		
30th Floor	646		
29th Floor	646		
28th Floor	646		
27th Floor	646		
26th Floor	646		
25th Floor	646		
24th Floor	646		
23rd Floor	646		
22nd Floor	646		
21st Floor	646		
20th Floor	646		
19th Floor	646		
18th Floor	646		
17th Floor	646		
16th Floor	646		
15th Floor	646		
14th Floor	646		
13th Floor	646		
12th Floor	646		
11th Floor	646		
10th Floor	646		
9th Floor	646		
8th Floor	646	8th Floor	1258
7th Floor	646	7th Floor	1258
6th Floor	646	6th Floor	1258
5th Floor	646	5th Floor	1258
4th Floor	646	4th Floor	1258
3rd Floor	844	3rd Floor	1258
2nd Floor	844	2nd Floor	1258
1st Floor	1064	1st Floor	1258

**SUM** 24070 sq.m

**10064 sq.m**

**TOTAL FIRE AREA** 34134 sq.m

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REVISED 10-Jun-19

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## Fire Flow Requirements

Proposed 25 Storey + 27 Storey Apartment Buildings + 6 Storey Podium  
FIREWALL DIVIDING THE PODIUM IN HALF  
WEST HALF (25 Storey Apartment Building + HALF of 6 Storey Podium)

Fire flow requirement as calculated as per Fire Underwriter Survey "Water Supply For Fire Protection".

$F = 220 C A^{0.5}$  = the required fire flow in litres per minute

C = coefficient related to the type of construction  
= 0.8 Non-Combustible Construction (Unprotected structural components)

A = total floor area (all storeys excluding basements at least 50% below grade)

**Please refer to Appendix "A1" for complete area breakdown**

TOTAL FIRE AREA: 22,727 sq.m.

F = 26,533 L/min  
= 27,000 L/min (rounded off to the nearest 1,000 L/min)

-15% Charge for Combustible Occupancy

= 22,950 L/min

50% Reduction for Sprinkler System

= 11,475 L/min

Increase for Separation Exposed Buildings

		Adjacent Building		Length- Height Factor
		Constuction	Length m	
0% North	>45m			0
10% East	Fire Wall			0
15% South	30.1 to 45m	N-C	25	900
12% West	10.1 to 20m	N-C	27	27
37% Total Increase for Exposure (maximum 75%)				
= 8,492 L/min Increase				

= 19,967 L/min

F = 20,000 L/min (rounded off to the nearest 1,000 L/min)

= 333.3 l/s

Approx. Elevation at Fire Hydrant 69.60 m ASL

(Existing on Ogilvie)

333 l/s FIRE FLOW: 110.0 m ASL

Static Pressure at Fire Hydrant

57 psi 396 kPa

Elevation at Fire Hydrant 69.16 m ASL

(Existing on Cummings)

333 l/s FIRE FLOW: 106.0 m ASL

Static Pressure at Fire Hydrant

52 psi 361 kPa

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## Appendix "A1"

ALL AREAS IN SQ.M

Tower 1 (West - 25 Storeys)

1/2 Podium (6 Storeys)

25th Floor	631				
24th Floor	631				
23rd Floor	810				
22nd Floor	810				
21st Floor	810				
20th Floor	810				
19th Floor	810				
18th Floor	810				
17th Floor	810				
16th Floor	810				
15th Floor	810				
14th Floor	810				
13th Floor	810				
12th Floor	810				
11th Floor	810				
10th Floor	810				
9th Floor	810				
8th Floor	810				
7th Floor	810				
6th Floor	863	6th Floor	419.5		
5th Floor	863	5th Floor	419.5		
4th Floor	863	4th Floor	419.5		
3rd Floor	863	3rd Floor	419.5		
2nd Floor	863	2nd Floor	419.5		
1st Floor	863	1st Floor	419.5		

**SUM** 20210 sq.m

2517 sq.m

**TOTAL FIRE AREA** 22727 sq.m

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## Fire Flow Requirements

Proposed 25 Storey + 27 Storey Apartment Buildings + 6 Storey Podium  
FIREWALL DIVIDING THE PODIUM IN HALF  
EAST HALF (27 Storey Apartment Building + HALF of 6 Storey Podium)

Fire flow requirement as calculated as per Fire Underwriter Survey "Water Supply For Fire Protection".

$$F = 220 C A^{0.5} = \text{the required fire flow in litres per minute}$$

C = coefficient related to the type of construction  
= 0.8 Non-Combustible Construction (Unprotected structural components)

A = total floor area (all storeys excluding basements at least 50% below grade)

**Please refer to Appendix "A2" for complete area breakdown**

TOTAL FIRE AREA: 24,239 sq.m.

$$F = 27,401 \text{ L/min}$$
$$= 27,000 \text{ L/min (rounded off to the nearest 1,000 L/min)}$$

-15% Charge for Combustible Occupancy

$$= 22,950 \text{ L/min}$$

50% Reduction for Sprinkler System

$$= 11,475 \text{ L/min}$$

Increase for Separation Exposed Buildings

				Adjacent Building		Length- Height Factor
				Constuction	Length m	
0% North	>45m					0
0% East	>45m					0
15% South	10.1 to 20m	N-C	44		36	1584
10% West	Fire Wall					0

$$= 5,738 \text{ L/min Increase}$$

$$= 17,213 \text{ L/min}$$

$$F = 17,000 \text{ L/min (rounded off to the nearest 1,000 L/min)}$$

$$= 283.3 \text{ l/s}$$



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25 Storey Apartment (Tower 1) + 6 Storey Podium + 27 Storey Apartment (Tower 2) + 36 Storey Apartment  
(Tower 3) + 8 Storey Hotel + Ground Floor Commercial

## Water Demand

<b>Apartment Buildings</b>					
	Number of Units	Persons Per Unit	Population		
Average Apartment:	850	1.8	1530		
DAILY AVERAGE:	350	litres / person / day			
	372	I / min	6.2	I/s	98 USgpm
MAXIMUM DAILY DEMAND:	2.50	(Peaking Factor as per City of Ottawa Water Guidelines)			
	930	I / min	15.5	I/s	246 USgpm
MAXIMUM HOURLY DEMAND:	2.20	(Peaking Factor as per City of Ottawa Water Guidelines)			
	2045	I / min	34.1	I/s	540 USgpm
<b>Hotel</b>					
DAILY AVERAGE:	225	L / room	(as per Ottawa Design Guidelines)		
	187	Rooms			
	42075	I / day			
	12	hour day			
	58.4	I/min	1.0	I/s	15 USgpm
MAXIMUM DAILY DEMAND:	1.5	(Peaking Factor as per Ottawa Design Guidelines)			
	88	I/min	1.5	I/s	23 USgpm
MAXIMUM HOURLY DEMAND:	1.8	(Peaking Factor as per Ottawa Design Guidelines)			
	158	I/min	2.6	I/s	42 USgpm
<b>Ground Floor Commercial</b>					
DAILY AVERAGE:	28,000	I / gross ha / day (as per Ottawa Design Guidelines)			
	1.54	ha (land area)			
	43120	I / day			
	12	hour day			
	60	I/min	1.0	I/s	16 USgpm
MAXIMUM DAILY DEMAND:	1.5	(Peaking Factor as per Ottawa Design Guidelines)			
	90	I/min	1.5	I/s	24 USgpm
MAXIMUM HOURLY DEMAND:	1.8	(Peaking Factor as per Ottawa Design Guidelines)			
	162	I/min	2.7	I/s	43 USgpm
<b>TOTAL DEMAND</b>					
TOTAL DAILY AVERAGE:	490	I/min	8.2	I/s	130 USgpm
TOTAL MAXIMUM DAILY DEMAND:	1107	I/min	18.5	I/s	293 USgpm
TOTAL MAXIMUM HOURLY DEMAND:	2365	I/min	39.4	I/s	625 USgpm

Elevation of Water Meter: 69.90 m ASL

Finish Floor Elevation: 69.00 m ASL

Static Pressure at Water Meter

MINIMUM HGL: 109.7 m ASL 57 psi 390 kPa

MAXIMUM HGL: 118.0 m ASL 68 psi 472 kPa





Douglas Gray &lt;d.gray@dbgrayengineering.com&gt;

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**1098 Ogilvie Rd & 1178 Cummings Ave - Boundary Condition Request**

1 message

**Douglas Gray** <d.gray@dbgrayengineering.com>

Tue, May 28, 2019 at 10:42 AM

To: Michael Boughton &lt;Michael.Boughton@ottawa.ca&gt;

Cc: Mark Young &lt;Mark.Young@ottawa.ca&gt;, François Moffet &lt;fmoffet@dmainsc.me&gt;, Caoimhin Kennedy &lt;c.kennedy@dbgrayengineering.com&gt;

Hi Micheal

We require boundary conditions for the above project. Please forward this email to the person in Infrastructure Approvals that will be reviewing this project. Thanks.

We are working on a project 1098 Ogilvie Rd & 1178 Cummings Ave. Two buildings are proposed. The north building is a 25 Storey Apartment + 27 Story Apartment + 6 Storey Podium connecting the two towers. The south building is a 36 Storey Apartment + 8 Storey Hotel.

Please provide the boundary conditions at this location based on the following demands.

Average daily demand: 8.0 l/s.  
Maximum daily demand: 18.2 l/s.  
Maximum hourly daily demand: 39.0 l/s  
Fire Flow demand: 416.7 l/s  
Fire Flow + Max Day: 434.9 l/s

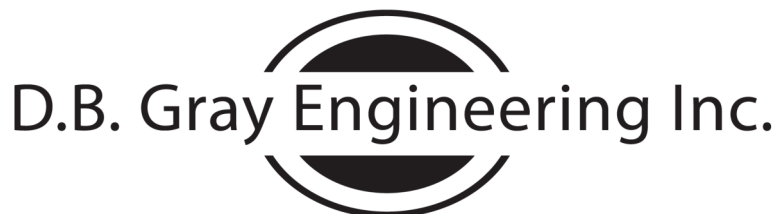
We are looking at an alternative design with a firewall so please also provide the boundary conditions for a fire flow demand of 333.3 l/s.

Average daily demand: 8.0 l/s.  
Maximum daily demand: 18.2 l/s.  
Maximum hourly daily demand: 39.0 l/s  
Fire Flow demand: 333.3 l/s  
Fire Flow + Max Day: 351.5 l/s

Calculations are attached.

The location of the proposed service connection has not yet been determined. It could be either Ogilvie Rd or Cummings Ave.

Thanks, Doug



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

700 Long Point Circle  
Ottawa, Ontario K1T 4E9

Tel: 613-425-8044  
[d.gray@dbgrayengineering.com](mailto:d.gray@dbgrayengineering.com)

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**5 attachments**

**Gray Eng FUS calcs Ogilvie & Cummings 2 North Towers Firewall West Tower May27-19.pdf**



28K



**Gray Eng FUS calcs Ogilvie & Cummings 2 North Towers May27-19.pdf**

31K



**Gray Eng FUS calcs Ogilvie & Cummings Hotel and 36 Storey May27-19.pdf**

28K



**Gray Eng FUS calcs Ogilvie & Cummings 2 North Towers Firewall East Tower May27-19.pdf**

28K



**Gray Eng Water Demand Ogilvie Rd & Cummings Ave May27-19.pdf**

21K



Douglas Gray &lt;d.gray@dbgrayengineering.com&gt;

**As requested**

1 message

**Curry, William** <William.Curry@ottawa.ca>

Mon, Jun 3, 2019 at 8:58 AM

To: "d.gray@dbgrayengineering.com" &lt;d.gray@dbgrayengineering.com&gt;

Please refer to Guidelines and Technical bulletin ISDTB-2014-02 concerning basic day demands greater than 0.5 L/s.

The following are boundary conditions, HGL, for hydraulic analysis at 1098 Ogilvie/1178 Cummings (zone 1E) assumed to be connected to either the 610mm on Ogilvie (Option 1) or 305mm on Cummings (Option 2). See attached PDF for locations.

	610mm on Ogilvie	305mm on Cummings
Min HGL	109.7m	109.7m
Max HGL	118.0m	118.0m
MaxDay + FireFlow (417 L/s)	109.0m	102.5m
MaxDay + FireFlow (333 L/s)	110.0m	106.0m

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 watermain 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.*

**Will Curry, C.E.T.**

Planning, Infrastructure and Economic Development /

Planification, d'infrastructure et de développement économique

City of Ottawa | Ville d'Ottawa

☎ 613.580.2424 ext./poste 16214

110 Laurier Ave., 4th Fl East;

Ottawa ON K1P 1J1

[William.Curry@Ottawa.ca](mailto:William.Curry@Ottawa.ca)

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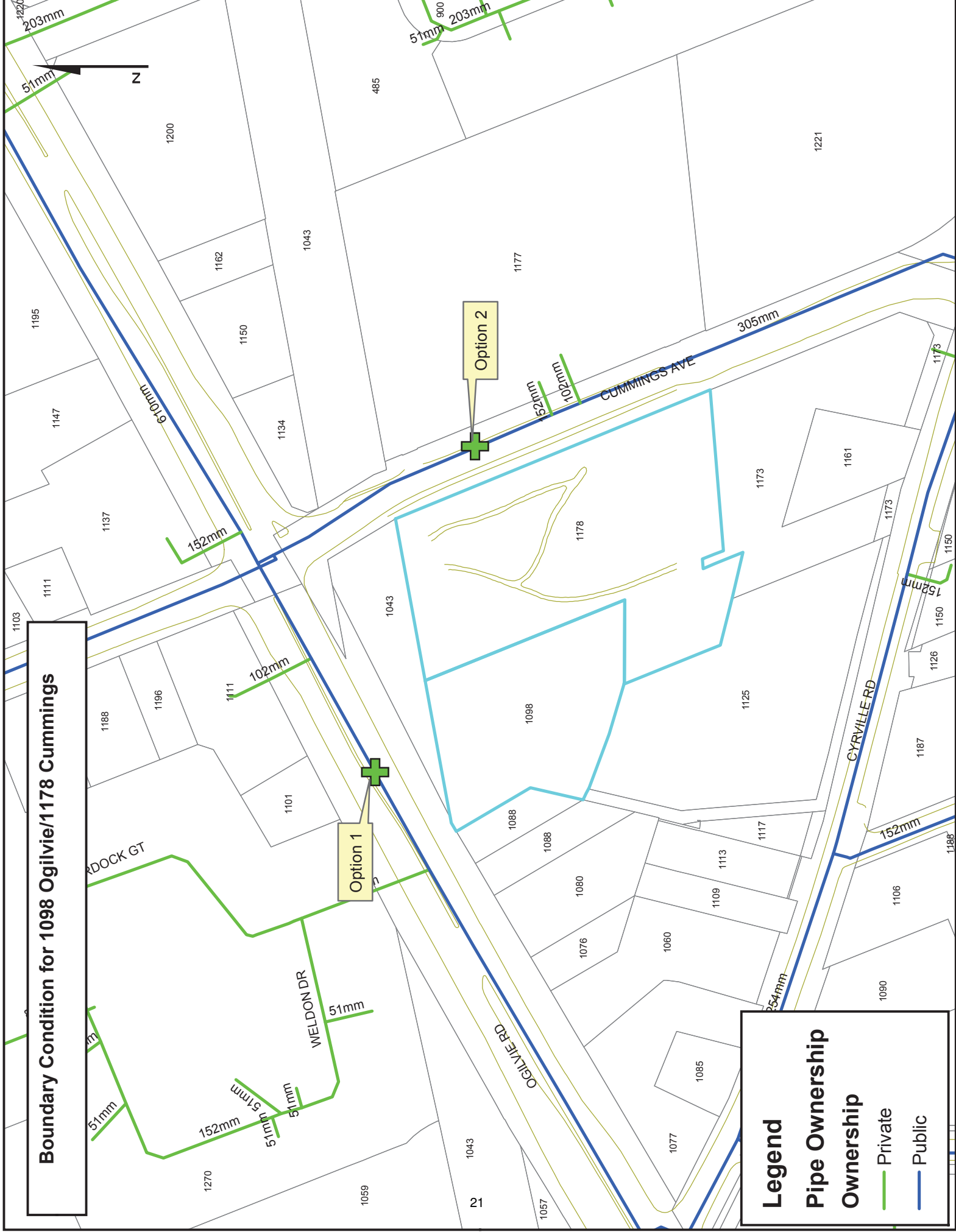
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**1098 Ogilvie June 2019.pdf**

120K





## Summary Table

ONE HUNDRED YEAR EVENT			
Drainage Area	Maximum Allowable Release Rate (L/s)	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	52.3	-
AREA II	-	35.5	478
TOTAL	87.7	87.7	478

1098 Ogilvie Road & 1178 Cummings Avenue  
Ottawa, Ontario

## STORM WATER MANAGEMENT CALCULATIONS Rational Method

### Five-Year Pre-Development Conditions

			C	
Roof Area:	0	ha	0.90	as per Table 5.7 Ottawa Sewer Design Guidelines: Woodland - Flat Clay / Silt Loam x 125%
Asphalt/Concrete Area:	0	ha	0.90	
"Woodland" Area:	1.54	ha	0.30	
Landscaped Area:	0	ha	0.20	
Total Catchment Area:	1.54	ha	0.30	

Airport Formula

$$T_c = \frac{3.26 (1.1 - C) (L)^{1/2}}{S_w^{0.33}} \text{ min}$$

Runoff Coefficient (C):	0.30	see above
Sheet Flow Distance (L):	120	m
Slope of Land (Sw):	2.6	%

Time of Concentration (Sheet Flow): 21 min

Area (A):	1.54	ha
Time of Concentration:	21	min
Rainfall Intensity (i):	68	mm/hr
Runoff Coefficient (C):	0.30	

Maximum Allowable Release Rate (2.78AiC): 87.7 L/s



## One Hundred-Year Event

### DRAINAGE AREA I (Uncontrolled Flow Off Site)

			C
Roof Area:	0	ha	1.00
Asphalt/Concrete Area:	0.05	ha	1.00
Landscaped Area:	0.21	ha	0.25
Total Catchment Area:	0.26	ha	0.40
Area (A):	0	ha	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr	
Runoff Coefficient (C):	0.40		
Flow Rate (2.78AiC):	52.3	L/s	

# One Hundred-Year Event

## DRAINAGE AREA II (Controlled Flow)

(One Hundred Year Event)

			C
Roof Area:	0.49	ha	1.00
Asphalt/Concrete Area:	0.00	ha	1.00
Ground Level Podium Area:	0.52	ha	1.00
Landscaped Area:	0.27	ha	0.25
Total Catchment Area:	1.28	ha	0.84

Maximum Release Rate: 35.5 L/s Maximum Volume Required: 478 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	727.4	35.5	691.9	208
10	179	535.1	35.5	499.7	300
15	143	428.3	35.5	392.8	353
20	120	359.5	35.5	324.0	389
25	104	311.2	35.5	275.7	414
30	92	275.3	35.5	239.8	432
35	83	247.5	35.5	212.0	445
40	75	225.2	35.5	189.7	455
45	69	206.9	35.5	171.5	463
50	64	191.7	35.5	156.2	469
55	60	178.7	35.5	143.2	473
60	56	167.5	35.5	132.0	475
65	53	157.8	35.5	122.3	477
70	50	149.2	35.5	113.7	478
75	47	141.6	35.5	106.1	478
80	45	134.8	35.5	99.4	477
85	43	128.7	35.5	93.2	476
90	41	123.2	35.5	87.7	474
95	39	118.2	35.5	82.7	471
100	38	113.6	35.5	78.1	469
105	36	109.4	35.5	73.9	466
110	35	105.5	35.5	70.0	462
115	34	101.9	35.5	66.4	458
120	33	98.6	35.5	63.1	454
125	32	95.5	35.5	60.0	450
130	31	92.6	35.5	57.1	446
135	30	89.9	35.5	54.4	441
140	29	87.4	35.5	51.9	436
145	28	85.0	35.5	49.5	431
150	28	82.7	35.5	47.3	425
180	24	71.6	35.5	36.2	390

## City of Ottawa Servicing Study Checklist

### General Content

**Executive Summary (for large reports only):** not applicable

**Date and revision number of the report:** see page 1 of Servicing and Stormwater Management Brief

**Location map and plan showing municipal address, boundary, and layout of proposed development:** see drawing C-1

**Plan showing the site and location of all existing services:** see drawing C-1

**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:** not available

**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 defensible design criteria:** not applicable

**Statement of objectives and servicing criteria:** see page 1 of Servicing and Stormwater Management Brief

**Identification of existing and proposed infrastructure available in the immediate area:** see drawing C-1

**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).** see drawing C-1

**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:** not applicable

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

- **Metric scale:** included
- **North arrow:** included
  - **(including construction North):** not included
- **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:** see page 2-4 of Servicing and Stormwater Management Brief

**Identification of system constraints:** see page 2-4 of Servicing and Stormwater Management Brief

**Confirmation of adequate domestic supply and pressure:** see page 2-4 of Servicing and Stormwater Management Brief

**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:** see page 2-4 of Servicing and Stormwater Management Brief

**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:** see page 2-4 of Servicing and Stormwater Management Brief

**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 feeder mains, 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:** see page 2 of Servicing Brief

**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:** see page 4-5 of Servicing and Stormwater Management Brief

**(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:** see page 4-5 of Servicing and Stormwater Management Brief

**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.** see page 16 of Servicing and Stormwater Management Brief

**Description of proposed sewer network including sewers, pumping stations, and forcemains:** see page 4-5 of Servicing and Stormwater Management Brief

**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):** see page 5-6 of Servicing and Stormwater Management Brief

**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:** see drawing C-1

**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:** see page 5-6 of Servicing and Stormwater Management Brief

**Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements:** Servicing Brief and Stormwater Management Report

**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:** the pre-application consultation record is not yet been issued

**Confirm consistency with sub-watershed 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).** see drawing C-1 and Servicing and Stormwater Management Brief

**Identification of watercourses within the proposed development and how watercourses will be protected, or , if necessary, altered by the proposed development with applicable approvals.** see drawing C-1 and Servicing and Stormwater Management Brief

**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:** . see Servicing and Stormwater Management Brief

**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:** .see Servicing and Stormwater Management Brief

**Identification of municipal drains and related approval requirements.** : not applicable

**Descriptions of how the conveyance and storage capacity will be achieved for the development:** see page 3 of Servicing Brief and Stormwater Management Report

**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:** see page 5 of Servicing and Stormwater Management Brief

**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:** not applicable

**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:** see page 7 of Servicing and Stormwater Management Brief

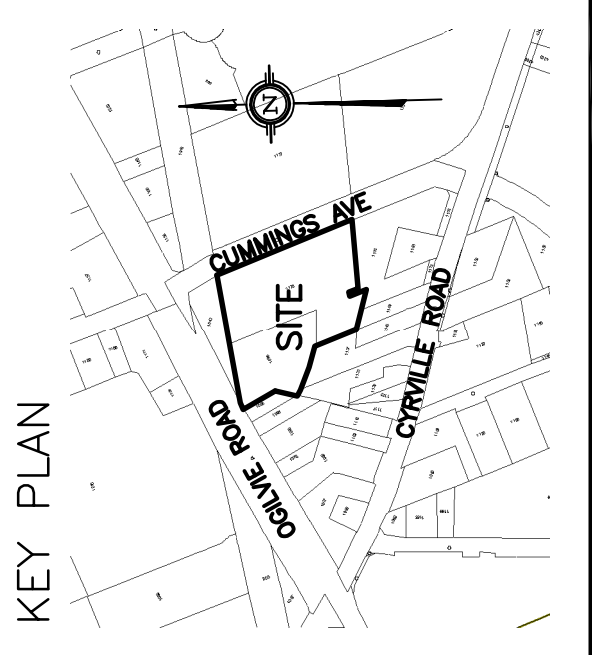
**Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.**

**All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario:** not applicable





DRAWING LEGEND	
CB	CATCH BASIN
MH	MANHOLE
CB/MH	CATCH BASIN/MANHOLE
SAN	SANITARY SEWER
ST	STORM SEWER
WS/WM	WATER SERVICE/WATERMAIN
FT	FIRE HYDRANT
X 66.15	EXISTING GRADE ELEVATION
---	PROPERTY LINE



No.	DATE	REVISION
1	JUN 18-19	PRELIMINARY

D. B. GRAY ENGINEERING INC.  
Sewerage Management - Grading & Drainage - Storm & Sanitary Sewer - Stormwater  
700 Long Point Circle  
Ottawa, Ontario  
613-425-8044  
dgray@dbgrayengineering.com

Project  
LUX PLACE  
HOTEL / APARTMENTS  
GROUND FLOOR COMMERCIAL  
1088 OGILVIE ROAD & 1178 CUMMINGS AVENUE  
OTTAWA, ONTARIO

Drawing Title  
**PRELIMINARY SITE  
SERVICING PLAN**

Engineer's Seal	Drawn: D.B.G. Hor. Scale Vert. Scale Date JUN 18-19 Job No. 18019	Drawing No. <b>C-1</b> of 1
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