

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES 1244 KILBORN PLACE



Project No.: CCO-22-3715

Prepared for:

Archdiocese of Ottawa
1244 Kilborn Place,
Ottawa, ON K1H 6L1

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road
Carp, ON K0A 1L0

March 22nd, 2022

TABLE OF CONTENTS

1.0	PROJECT DESCRIPTION	1
1.1	<i>Purpose</i>	1
1.2	<i>Site Description</i>	1
1.3	<i>Existing Conditions and Infrastructure.....</i>	1
1.4	<i>Proposed Development and Statistics.....</i>	2
1.5	<i>Approvals</i>	2
2.0	BACKGROUND STUDIES, STANDARDS AND REFERENCES.....	3
2.1	<i>Background Reports / Reference Information</i>	3
2.2	<i>Applicable Guidelines and Standards.....</i>	3
3.0	PRE-CONSULTATION SUMMARY	3
4.0	WATERMAIN	4
4.1	<i>Existing Watermain.....</i>	4
4.2	<i>Proposed Watermain</i>	4
5.0	SANITARY DESIGN	6
5.1	<i>Existing Sanitary Sewer</i>	6
5.2	<i>Proposed Sanitary Sewer</i>	6
6.0	STORM DESIGN	8
6.1	<i>Existing Storm Sewer.....</i>	8
6.2	<i>Proposed Storm Sewer</i>	8
7.0	STORMWATER MANAGEMENT	9
7.1	<i>Design Criteria and Methodology</i>	9
7.2	<i>Runoff Calculations</i>	9
7.3	<i>Site Drainage.....</i>	10
8.0	SUMMARY	11
9.0	RECOMMENDATION.....	12
10.0	STATEMENT OF LIMITATIONS	13

LIST OF TABLES

Table 1: Water Demands	5
Table 2: Boundary Conditions Results	5
Table 3: Fire Protection Confirmation	5
Table 4: Sanitary Design Criteria	6
Table 5: Summary of Estimated Sanitary Flow	7
Table 6: Pre-Development Runoff Summary	10
Table 7: Post Development Flow Rate and Storage Requirements	10

APPENDICES

Appendix A: Site Location Plan	
Appendix B: City of Ottawa Pre-Consultation Notes	
Appendix C: Watermain Calculations	
Appendix D: Sanitary Calculations	
Appendix E: Pre-Development Drainage Plan	
Appendix F: Post-Development Drainage Plan	
Appendix G: Stormwater Management Calculations	

1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by the Archdiocese of Ottawa to prepare this Assessment of Adequacy of Public Services Report in support of the Zoning By-law Amendment for the contemplated development at 1244 Kilborn Place within the City of Ottawa.

The main purpose of this report is to demonstrate that the proposed development has access to sufficient public services in accordance with the recommendations and guidelines provided by the City of Ottawa (City), the Rideau Valley Conservation Authority (RVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address access to water, sanitary and storm servicing for the development, ensuring that existing services will adequately service the proposed development.

1.2 Site Description

The property, herein referred to as the site, is located at 1244 Kilborn Place within the Alta Vista ward in the City of Ottawa. The site covers approximately 8503 m² (0.85 ha) and is located at the south-west corner of the Kilborn Place and Lamira Street intersection. The site is zoned Minor Institutional (I1A).

1.3 Existing Conditions and Infrastructure

The site is currently developed and consists of a two-storey, church building fronting Kilborn Place and Lamira Street. It is assumed the existing church is serviced by local water, sanitary, and storm services.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

◆ Kilborn Place

- 203 mm diameter PVC watermain;
- 450 mm diameter concrete sanitary sewer, tributary to the Rideau River Collector; and a
- 300 mm diameter concrete storm sewer, outlets to Sawmill Creek and tributary to the Rideau River.

◆ Lamira Street

- 300 mm diameter concrete storm sewer, outlets to Sawmill Creek and tributary to the Rideau River.

1.4 Proposed Development and Statistics

The contemplated development consists of two 4-storey; mixed-use buildings. The *Site Plan* anticipates that the buildings A and B will have **54** and **64** apartment units, respectively. Building A is anticipated to have **1176 m²** of retail area. The development will also feature parkland area at the North of the site and an outdoor amenity area to the south. Residential parking is anticipated to be provided underground while visitor parking is to be provided at the north-west corner of the site.

1.5 Approvals

The contemplated development will be subject to the City of Ottawa site plan control approval process, subsequent the zoning by-law amendment process. Site plan control requires the City to review, provided concurrence and approve the engineering design package. Permits to construct can be requested once the City has issued a site plan agreement.

An Environmental Compliance Approval (*ECA*) through the Ministry of Environment, Conservation and Parks (*MECP*) may be required for the contemplated development. Further discussion with the *MECP* will take place during Site Plan Control to confirm requirements.

2.0 BACKGROUND STUDIES, STANDARDS AND REFERENCES

2.1 Background Reports / Reference Information

As-built drawings of existing services, provided by the City of Ottawa Information Centre, within the vicinity of the site were reviewed in order to identify infrastructure available to service the contemplated development.

The Sawmill Creek Subwatershed Study Update, completed by CH2M Hill on May 23, 2003, was provided by the City of Ottawa Information Centre.

2.2 Applicable Guidelines and Standards

City of Ottawa:

- ◆ Ottawa Sewer Design Guidelines, City of Ottawa, SDG002, October 2012. (*Ottawa Sewer Guidelines*)
 - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014. (*ISTB-2014-01*)
 - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018. (*ISTB-2018-01*)
 - Technical Bulletin ISTB-2018-03 City of Ottawa, March 2018. (*ISTB-2018-03*)
 - Technical Bulletin ISTB-2019-01 City of Ottawa, January 2019. (*ISTB-2019-01*)
 - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. (*ISTB-2019-02*)
- ◆ Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. (*Ottawa Water Guidelines*)
 - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. (*ISD-2010-2*)
 - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (*ISDTB-2014-02*)
 - Technical Bulletin ISTB-2018-03 City of Ottawa, March 2018. (*ISTB-2018-03*)

Ministry of Environment, Conservation and Parks:

- ◆ Stormwater Planning and Design Manual, Ministry of the Environment, March 2003. (*MECP Stormwater Design Manual*)
- ◆ Design Guidelines for Sewage Works, Ministry of the Environment, 2008. (*MECP Sewer Design Guidelines*)

3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was conducted with the City regarding the proposed site. The notes from this meeting can be found in *Appendix 'B'*.

4.0 WATERMAIN

4.1 Existing Watermain

The subject site is located within the 2C pressure zone, as shown by the Water Distribution figure located in **Appendix 'C'**.

There is an existing 203 mm diameter PVC watermain, that runs the entire length of the property within Kilborn Place. There are also two public hydrants directly adjacent to the property on Kilborn Place. From a preliminary review, it is assumed that the existing development is serviced by a lateral connected to the existing 200 mm watermain.

4.2 Proposed Watermain

It is anticipated that the development will be serviced from Kilborn Place via a 150 mm or 200 mm internal watermain network. Based on the **Ottawa Water Guidelines**, as the demand is greater than 50 m³ per day, a dual connection may be required. It is anticipated that the existing hydrants within Kilborn Place will provide adequate fire protection to the subject site.

The Fire Underwriters Survey 1999 (FUS) method was utilized to determine the required fire flow for the contemplated development. The 'C' factor (type of construction) for the FUS calculation was determined to be 0.8 (non-combustible construction). The total floor area ('A' value) for the FUS calculation was determined to be **5,136.0 m²** for Building A, and **6,016.0 m²** for Building B. The results of the calculations yielded a maximum required fire flow of **11,000 L/min** for the site. The detailed calculations for the FUS can be found in **Appendix 'C'**.

The water demands for the contemplated development have been calculated to adhere to the *Ottawa Design Guidelines – Water Distribution* manual and can be found in **Appendix 'C'**. The results have been summarized below in **Table 1**.

Table 1: Water Demands

Water Demand Rate (Residential)	280 L/c/day
Site Area (ha)	0.85
Average Day Demand (L/s)	0.73
Maximum Daily Demand (L/s)	3.44
Peak Hourly Demand (L/s)	5.21
FUS Fire Flow Requirement Building A (L/s)	150.00
FUS Fire Flow Requirement Building B (L/s)	183.33
Max Day + Fire Flow (L/s)	186.77

The City provided both the estimated minimum and maximum water pressures, as well as the estimated water pressure during fire flow demand for the demands indicated by the correspondence in **Appendix 'C'**. As shown in **Table 2** below, the minimum and maximum pressures fall within the required range identified in the City of Ottawa Water Supply guidelines.

Table 2: Boundary Conditions Results

Scenario	m H2O	Pressure (kPa) *
Minimum HGL	46.8	459.1
Maximum HGL	55.0	539.6
Maximum Daily + Fire Flow Demand (183 L/s)	38.6	378.7

**Note: Pressures adjusted for an elevation of 77.0m*

To confirm the adequacy of fire flow to protect the proposed development, public fire hydrants within 150 m of the proposed building were accounted for per the City of Ottawa ISTB 2018-02 Appendix I, Table 1, as demonstrated below. A location map showing the hydrant proximities to the site can be found in **Appendix 'C'**.

Table 3: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m (5,700 L/min)	Fire Hydrant(s) within 150m (3,800 L/min)	Combined Fire Flow (L/min.)
1244 Kilborn Place	11,000	3	3	28,500

Based on City guidelines the existing hydrants located in the vicinity can provide adequate fire protection to the site.

5.0 SANITARY DESIGN

5.1 Existing Sanitary Sewer

The subject site lies within the Rideau River Catchment and is tributary to the Rideau River Collector. The following subsections outline the sanitary infrastructure that exists within Kilborn Place.

The church building on the site is currently serviced by a service connection to the municipal 450 mm diameter sewer within Kilborn Place. The existing sewer is tributary to the Rideau River Collector.

5.2 Proposed Sanitary Sewer

Table 4, below, summarizes the wastewater design criteria identified by the *Ottawa Sewer Guidelines*.

Table 4: Sanitary Design Criteria

Design Parameter	Value
Average Apartment	1.8 persons/unit
Residential Average Daily Demand	280 L/day/person
Commercial / Amenity Space	2800 L/(1000m ² /day)

The peak design flow was calculated for the contemplated development using the *Ottawa Sewer Guidelines* and was determined to be **2.80 L/s**. Wastewater calculations are based on the site statistics provided by Fotenn Planning and Design utilizing flow criteria identified in Appendix 4-A of the *Ottawa Sewer Guidelines*. Refer to **Appendix 'D'** for detailed calculations.

Table 5, below, summarizes the estimated wastewater flow from the contemplated development. Refer to **Appendix 'D'** for detailed calculations.

Table 5: Summary of Estimated Sanitary Flow

Design Parameter	Total Site Flow (L/S)
Total Estimated Average Dry Weather Flow	0.79
Total Estimated Peak Dry Weather Flow	2.56
Total Estimated Peak Wet Weather Flow	2.8

It is anticipated that each building will be serviced via a 200 mm diameter service lateral in accordance with the **Ottawa Sewer Guidelines**. The capacity of each proposed 200 mm diameter service lateral is 33.77 L/s at an assumed 1.0% slope.

The estimated capacity of the existing 450 mm diameter sanitary sewer within Kilborn place is 187.67 L/s at an assumed 0.40% slope. The increase in sanitary flow due to the site is estimated to be 1.49% of the pipe capacity within Kilborn Place. Due to the complexity of the downstream network, the City will need to advise of any downstream constraints.

6.0 STORM DESIGN

6.1 Existing Storm Sewer

The following section outlines the storm infrastructure that exists within Kilborn Place and Lamira Street. The sewers surrounding the subject site outlet into Sawmill Creek which is tributary to the Rideau River.

Existing drainage from the site flows overland to catch basins within Kilborn Place and Lamira Street. There are existing 300 mm diameter storm sewers within Kilborn Place and Lamira Street. The storm sewer within Kilborn Place slopes to the west and outlets to Sawmill Creek. The storm sewer within Lamira Street slopes to the south and outlets to Sawmill Creek.

6.2 Proposed Storm Sewer

It is anticipated that runoff will be directed off site to the existing storm infrastructure at a restricted rate, as discussed in *Section 7.1*. Unrestricted runoff will sheet flow off site and restricted runoff will be directed to the existing stormwater infrastructure within Kilborn Place and Lamira Street. It is anticipated that a combination of surface and subsurface storage will be required to meet the SWM criteria identified by the City of Ottawa.

7.0 STORMWATER MANAGEMENT

7.1 Design Criteria and Methodology

Stormwater management for the site will be maintained through positive drainage away from the contemplated buildings and towards the adjacent ROWs. The quantitative and qualitative properties of the storm runoff for both the pre & post development flows are further detailed below.

In summary, the following design criteria have been employed in developing the stormwater management design for the site as directed by the RVCA and City:

Quality Control

- Based on the Sawmill Creek Subwatershed Study Update, MECP Level 1 treatment will be required. Therefore, an enhanced level of treatment will need to be implemented during detailed design.

Quantity Control

- The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5.
- Ensure no overland flow for all storms up to and including the 100-year event.
- Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site
- Post development 100-year flow is to be restricted to the 5-year storm with a calculated time of concentration greater or equal to 10 minutes.

7.2 Runoff Calculations

Runoff calculations presented in this report are derived using the Rational Method, given as:

$$Q = 2.78CIA \text{ (L/s)}$$

Where	C	= Runoff coefficient
	I	= Rainfall intensity in mm/hr (City of Ottawa IDF curves)
	A	= Drainage area in hectares

It is recognized that the Rational Method tends to overestimate runoff rates. As a result, the conservative calculation of runoff ensures that any stormwater management facility sized using this method is anticipated to function as intended.

The following coefficients were used to develop an average C for each area:

Roofs/Concrete/Asphalt	0.90
Undeveloped and Grass	0.20

As per the *Ottawa Sewer Guidelines*, the 5-year balanced ‘C’ value must be increased by 25% for a 100-year storm event to a maximum of 1.0.

Based on pre-development conditions, the time of concentration (Tc) used for the post-development design was estimated to be 10 minutes.

7.3 Site Drainage

Based on the criteria listed in Section 7.1, the development limit will be required to restrict flow to **123.15 L/s** in the 100-year event.

It has been assumed that the existing development contained no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 2, 5, and 100-year events are summarized below in **Table 6**.

Table 6: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Runoff Coefficient (2/5-Year)	Runoff Coefficient (100-Year)	Q (L/s)		
				2-Year	5-Year	100-Year
A1	0.85	0.73	0.82	132.43	179.65	344.94

To meet the stormwater objectives the contemplated development may contain a combination of flow attenuation along the surface and subsurface storage.

The following storage requirement estimate assumes that approximately 10% of the development area will be directed to the outlet without flow attenuation. The estimated post-development peak flows for the 5 and 100-year events and the required storage volumes are summarized below in **Table 7**, below.

Table 7: Post Development Flow Rate and Storage Requirements

Drainage Area	Runoff Coefficient (2/5-Year)	Runoff Coefficient (100-Year)	Unrestricted Flow (L/S)		Restricted Flow (L/S)		Storage Required (m ³)	
			5-year	100-Year	5-Year	100-Year	5-Year	100-Year
B1 (Restricted)	0.64	0.72	141.38	273.16	48.03	92.80	58.74	113.16
B2 (Unrestricted)	0.64	0.72	15.71	30.35	15.71	30.35	-	-
Total			157.09	303.51	63.74	123.15	58.74	113.16

It is anticipated that approximately **113.16 m³** of storage will be required on site to attenuate flow to the established release rate of **123.15 L/s**. Flow and storage calculations can be found within **Appendix ‘G’**. Actual storage volumes will need to be confirmed at the detailed design stage based on grading constraints.

It is anticipated that quality controls will be provided by an oil/grit separator or enhanced grass swales.

8.0 SUMMARY

- Two new mixed-use buildings are contemplated for development on 1244 Kilborn Place;
- The FUS method estimated fire flow indicated **11,000 L/min** is required for the contemplated development;
- The development is anticipated to have a peak wet weather flow of **2.80 L/s**. Further communications with the City are required to determine if the existing municipal sewer is anticipated to have sufficient capacity to support development;
- Based on City of Ottawa guidelines, the development will be required to attenuate post-development 100-year flows to an equivalent pre-development release rate of **123.15 L/s** events. This flow rate is based on the site area of 0.85 ha and will need to be reviewed during detailed design;
- It is contemplated that stormwater objectives may be met through storm water retention via roof top, surface, and/or subsurface storage. Approximately **113 m³** of onsite storage will be required to attenuate flow to the established release rate above; and
- Enhanced level quality controls are anticipated to be provided by an oil/grit separator or enhanced grass swales.

9.0 RECOMMENDATION

Based on the information presented in this report, we recommend that City of Ottawa approve this Assessment of Adequacy of Public Services in support of the proposed rezoning for 1244 Kilborn Place.

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.



Alison J. Gosling, P.Eng.
Project Engineer, Land Development
T: 613.714.4629
E: a.gosling@mcintoshperry.com

A handwritten signature in black ink, appearing to read "Ryan Robineau".

Ryan Robineau, EIT.
Civil Engineering Tech, Land Development
T: 613.714.6611
E: r.robineau@mcintoshperry.com

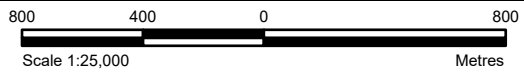
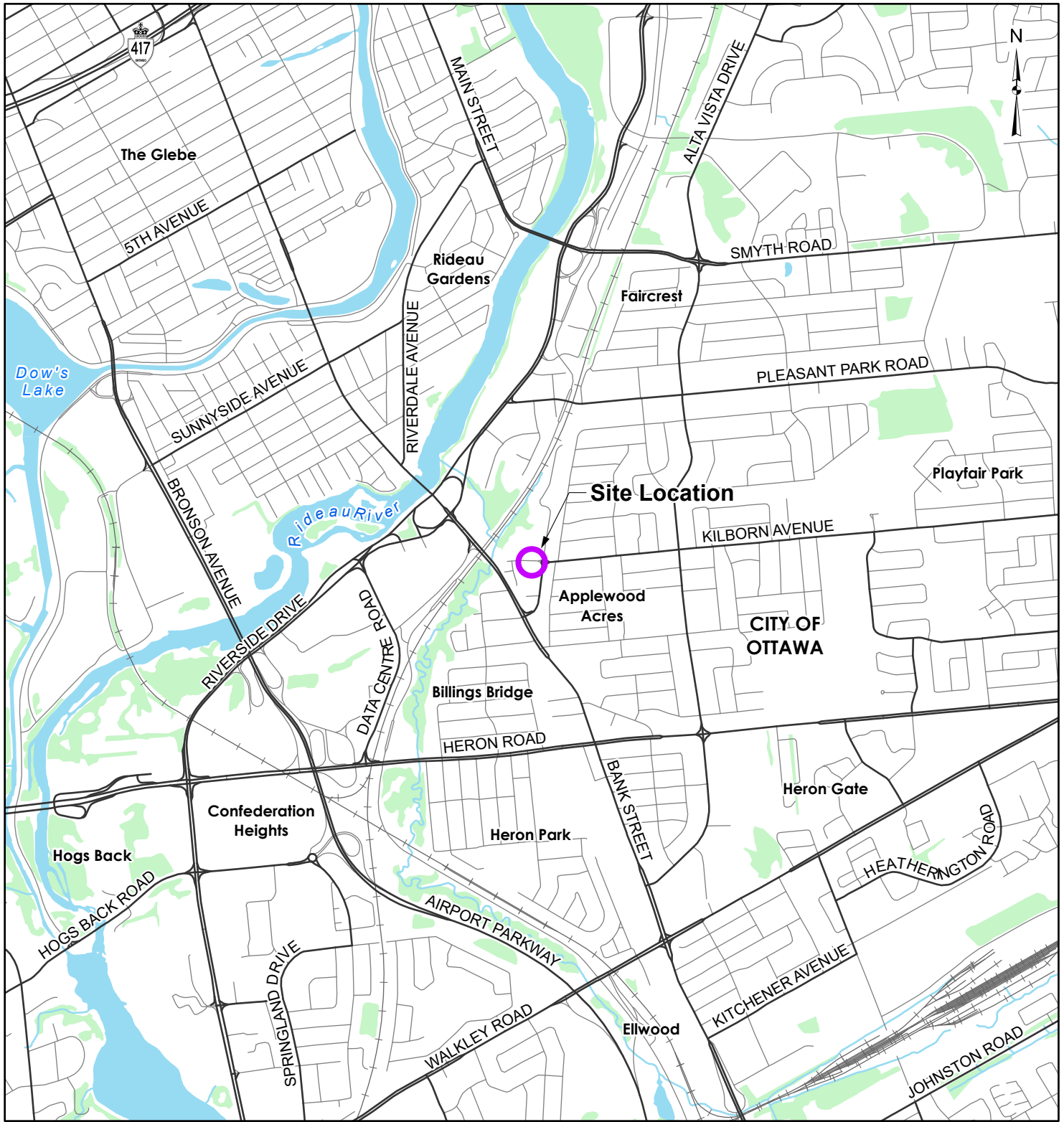
10.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of the Archdiocese of Ottawa. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Parks and Climate Change, City of Ottawa and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A
KEY PLAN



LEGEND

- Site Location
- Local Road
- Major Road
- Railroad
- Watercourse
- Waterbody
- Wooded Area

REFERENCE

GIS data provided by the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry, 2022.

CLIENT:	ARCHDIOCESE OF OTTAWA		
PROJECT:	1244 KILBORN PLACE, OTTAWA, ON		
TITLE:	SITE LOCATION		
	PROJECT NO.: CCO-22-3715	FIGURE:	1
	Date	Jan., 26, 2022	
	GIS	EU	
	Checked By	RR	

McINTOSH PERRY
 115 Walgreen Road, RR3, Carp, ON K0A1L0
 Tel: 613-836-2184 Fax: 613-836-3742
 www.mcintoshperry.com

C:\Users\stunum\Documents\Projects\2022\CCO\CCO-22-3715\Archdiocese of Ottawa\Civil\1244_Kilborn\ArchKey_Maps\andDevelopment\CCO-22-3715_OptionD_SiteLocation.aprx

APPENDIX B
BACKGROUND DOCUMENTS

From: Thomas Freeman <freeman@fotenn.com>
Sent: February 28, 2022 10:31 AM
To: Alison Gosling <a.gosling@mcintoshperry.com>
Subject: RE: 22-3715 - 1244 Kilborn - Site Stats

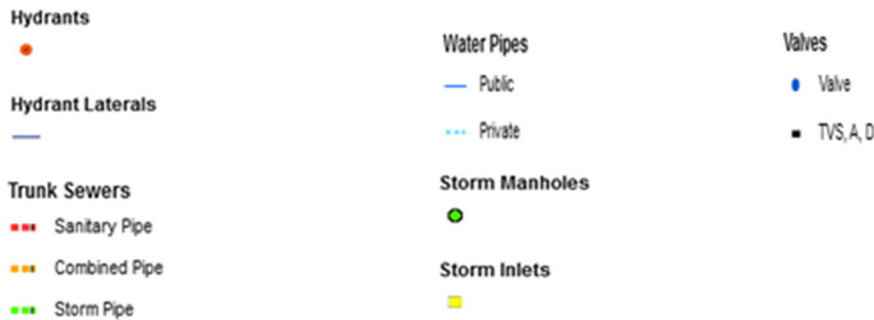
Hi Alison,

My bad, I should have forwarded these to you.

Comments:

- The Servicing Study Guidelines for Development Applications are available at the following address: <https://ottawa.ca/en/city-hall/planning-and-development/how-develop-property/development-application-review-process-2/guide-preparing-studies-and-plans>
- Servicing and site works shall be in accordance with the following documents:
 - Ottawa Sewer Design Guidelines (October 2012) and all the Technical Bulletins including, Technical Bulletin PIEDTB-2016-01 and ISTB-2018-01
 - Ottawa Design Guidelines – Water Distribution (2010) and Technical Bulletins ISD-2010-2, ISDTB-2014-02 and ISTB-2018-02
 - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
 - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
 - City of Ottawa Environmental Noise Control Guidelines (January, 2016)
 - City of Ottawa Park and Pathway Development Manual (2012)
 - City of Ottawa Accessibility Design Standards (2012)
 - Ottawa Standard Tender Documents (latest version)
 - Ontario Provincial Standards for Roads & Public Works (2013)
- Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x 44455
- The Stormwater Management Criteria, for the subject site, is to be based on the following (as established in the Citigate Centre Site Servicing Report):
 - The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
 - Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site
 - Ensure no overland flow for all storms up to and including the 100-year event.
 - The 2-yr storm or 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
 - A calculated time of concentration (Cannot be less than 10 minutes).

- Quality control requirements to be provided by Rideau Valley Conservation Authority (RVCA)
- This property is located within the Sawmill Creek subwatershed. Please verify any subwatershed specific SWM criteria with the RVCA.
- Deep Services:



- i. A plan view of the approximate services may be seen above. Services should ideally be grouped in a common trench to minimize the number of road cuts. The sizing of available future services is:
 - a. Connections (Kilborn Place):
 - i. Existing 300 mm dia. STM (Conc.)
 - ii. Existing 203 mm dia. Watermain (DI)
 - iii. Existing 450 mm dia. SAN (Conc.)
 - ii. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.
 - iii. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).
 - iv. Provide information on the type of connection permitted
- Sewer connections to be made above the springline of the sewermain as per:
- a. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.
 - b. Std Dwg S11 (For rigid main sewers) – lateral must be less than 50% the diameter of the sewermain,

- c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – *for larger diameter laterals where manufactured inserts are not available; lateral must be less than 50% the diameter of the sewermain,*
- d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.
- e. *No submerged outlet connections.*
- Civil consultant must request boundary conditions from the City’s assigned Project Manager prior to first submission. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:
 - i. Location of service(s)
 - ii. Type of development and the amount of fire flow required (as per FUS, 1999).
 - iii. Average daily demand: ___ l/s.
 - iv. Maximum daily demand: ___ l/s.
 - v. Maximum hourly daily demand: ___ l/s.
 - vi. Hydrant location and spacing to meet City’s Water Design guidelines.
 - vii. Water supply redundancy will be required for more than 50 m³/day water demand.
- Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
- If applicable, MECP ECA Requirements are as below:

All development applications should be considered for an Environmental Compliance Approval (ECA) by the Ministry of the Environment, Conservation, and Parks (MECP);

 - a. Consultant determines if an approval for sewage works under Section 53 of OWRA is required. Consultant then determines what type of application is required and the City’s project manager confirms. (If the consultant is not clear if an ECA is required, they will work with the City to determine what is required. If the consultant it is still unclear or there is a difference of opinion only then will the City PM approach the MECP.
 - b. The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.
 - c. Standard Works ToR Draft ECA’s are sent to the local MECP office (moeccottawasewage@ontario.ca) for information only
 - d. Additional ToR draft ECAs require a project summary/design brief and require a response from the local MECP (10 business day window)
 - e. Site plan Approval, or Draft Approval, is required before an application is sent to the MECP
- Please contact Tyler Cassidy (Tyler.Cassidy@Ottawa.ca) to discuss engineering requirements further should you have any questions.

Thomas Freeman, B.URPL

Planner

Out of Office - COVID-19

Please be advised that Fotenn staff are currently working remotely in accordance with government recommendations for social distancing. Otherwise I am working regularly and am available by email, phone or video conference.

Ryan Robineau

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: March 1, 2022 9:11 AM
To: Ryan Robineau
Cc: Alison Gosling
Subject: RE: 1244 Kilborn Quality Control Requirement

Good Morning Ryan,

The water quality target will be 80% TSS removal. You will also need to consult the Sawmill Creek Subwatershed Study, as there may be more specific stormwater criteria in that document that will impact this site.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
[Jamie.batchelor@rvca.ca](mailto:jamie.batchelor@rvca.ca)



3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

This message may contain information that is privileged or confidential and is intended to be for the use of the individual(s) or entity n may contain confidential or personal information which may be subject to the provisions of the *Municipal Freedom of Information & Access Act*. If you are not the intended recipient of this e-mail, any use, review, revision, retransmission, distribution, dissemination, copying, printing, taking of any action in reliance upon this e-mail, is strictly prohibited. If you have received this e-mail in error, please contact the sender and any copy of the e-mail and any printout thereof, immediately. Your cooperation is appreciated.

From: Ryan Robineau <r.robineau@mcintoshperry.com>
Sent: Tuesday, March 1, 2022 7:58 AM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Alison Gosling <a.gosling@mcintoshperry.com>
Subject: 1244 Kilborn Quality Control Requirement

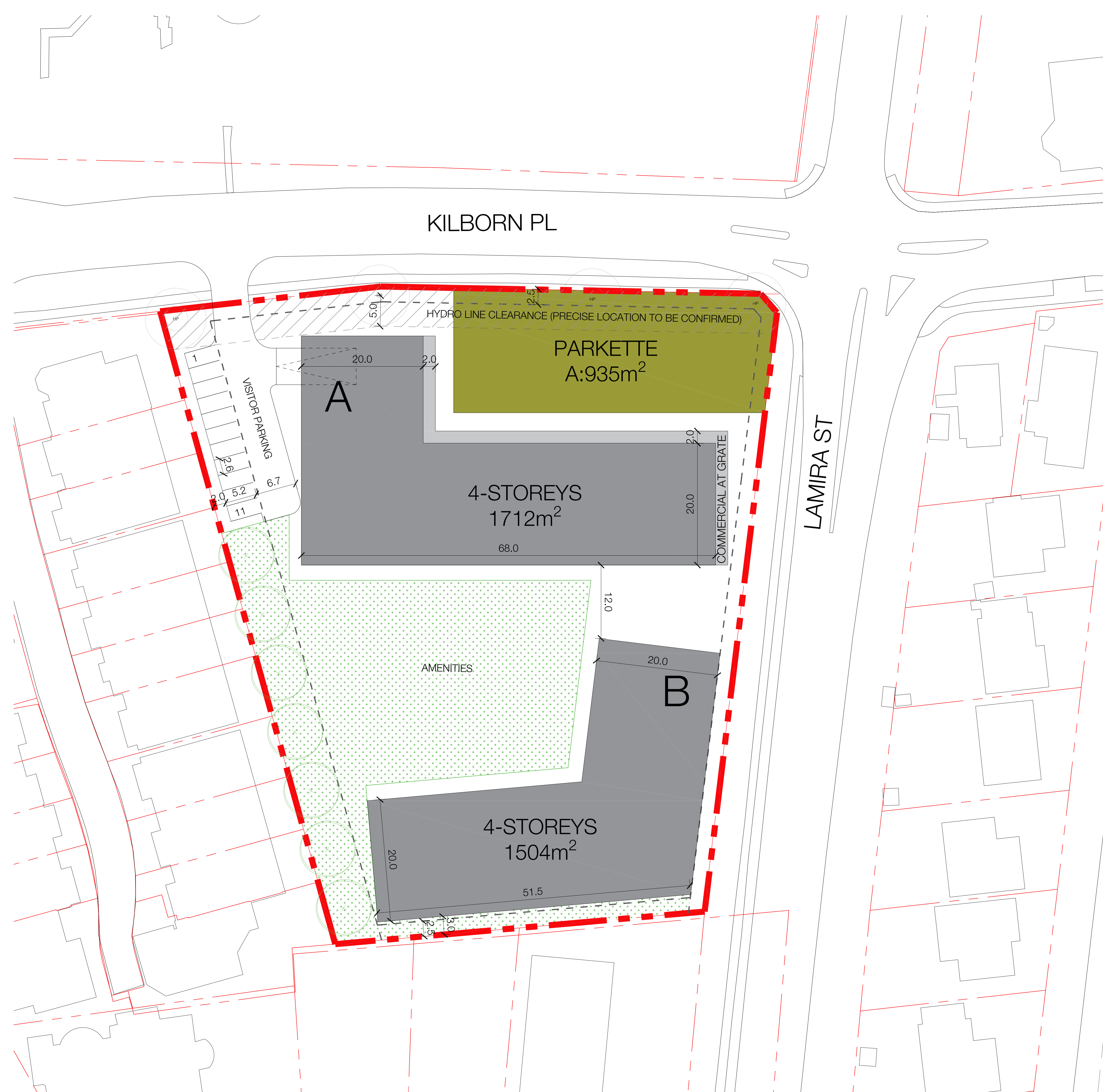
Good morning Jamie,

We wanted to touch base with you regarding a contemplated development at 1244 Kilborn Place.

The development involves the construction of two 4-storey mixed use buildings with above and underground parking. Drainage will be collected and conveyed to the 300mm dia storm sewer within Kilborn Place. As shown by the attached figure, water travels approximately 164 m to Sawmill Creek (Outlet ID #04376). It is anticipated that drainage will be collected by roof drains, catch basins and surface drains which will be connected to the internal mechanical system.

We would like to know what SWM requirements the RVCA would have for the site.

Please let me know if you have any questions.



SITE INFORMATION

ZONING	I1A
SITE AREA	
Total Site Area:	8,503m ²
HEIGHT	Permitted 4 Storeys (12m)
PARKING RATES	REQUIRED
Residential:	0.5 p/unit
Visitor:	0.1p/unit
Retail:	2.5p/100m ²
AMENITIES RATE	
Required	6m ² / unit
SETBACKS	F.Y. S.Y. R.Y. 2.5m 2.5m 7.5m
FSI	2.0

DEVELOPMENT STATISTICS

RESIDENTIAL UNITS		
Apartment (Assumes an 85% efficiency):		118
HEIGHT		4 Storeys (12m)
GFA	Retail 1,000m ²	Residential 9,479m ²
TOTAL AREA	Retail 1,167m ²	Residential 11,152m ²
FSI		1.23

PARKING	Required	Provided
Residential:	53	TBD (underground)
Visitor:	12	11 (surface)
Retail:	25	TBD
Total:	90	TBD
PARKLAND DEDICATION (10%)		935m ²
AMENITIES		
Required	6m ² x 118 =	711m ²

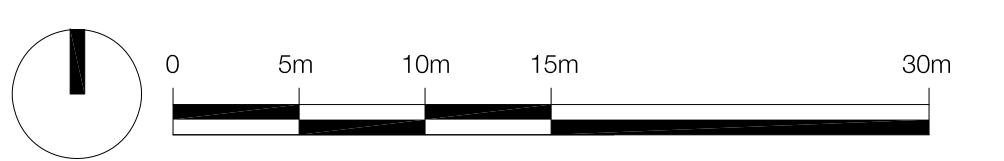
- NOTES**
- Assumes typical Residential floor height of 3m. Assumes Retail Ground floor height of 4.5m.
 - For the purpose of this concept, an average of 80m² (860sf) unit size is used to calculate approximate total number of units.
 - *GFA: as defined in City of Ottawa Zoning Bylaw means the total area of each floor whether located above, at or below grade, measured from the interiors of outside walls, but excluding areas dedicated for uses such as mechanical and electrical rooms, common hallways, corridors, staircases and elevators, interior amenities, bicycle storage and parking. Assume 85% efficiency for Retail, Office and Apartment buildings. Areas are approximate. Building includes interior amenity areas for the residents.
 - The base plan (lot lines, existing roads and surrounding areas) is based on the City's Open Data and aerial images. The site area is approximate and all dimensions need to be confirmed by a legal survey.
 - This concept is part of a development concept report and should be interpreted as per findings and descriptions of such report. This concept may require minor variances for setback reduction, parking, heights, etc.

**1244
KILBORN STREET
OTTAWA**
Option 2



LEGEND

	PROPOSED BUILDING
	AMENITY SPACE
	PROPERTY BOUNDARY
	SETBACKS
	HYDRO POLE



3	CONCEPT PLAN	2022.01.07	TS
2	CONCEPT PLAN	2021.12.23	LC
1	BASE PLAN	2021.12.07	LC
No.	REVISION	DATE	BY

CLIENT
ARCHDIOCESE OF OTTAWA

FOTENN
Planning + Design

396 Cooper Street, Suite 300, Ottawa ON K2P 2H7
613.730.5709 www.fotenn.com

DESIGNED	TS
REVIEWED	TS
DATE	2021.12.23

P2

APPENDIX C
WATERMAIN CALCULATIONS

McINTOSH PERRY

CCO-22-3715 - 1244 Kilborn - Water Demands

Project:	1244 Kilborn
Project No.:	CCO-22-3715
Designed By:	R.R.R.
Checked By:	R.D.F.
Date:	February 25, 2022
Site Area:	0.85 gross ha

<u>Residential</u>	NUMBER OF UNITS		UNIT RATE	
Single Family		homes	3.4	persons/unit
Semi-detached		homes	2.7	persons/unit
Townhouse		homes	2.7	persons/unit
Bachelor Apartment		units	1.4	persons/unit
1 Bedroom Apartment		units	1.4	persons/unit
2 Bedroom Apartment		units	2.1	persons/unit
3 Bedroom Apartment		units	3.1	persons/unit
Average Apartment	118	units	1.8	persons/unit

Total Population 213 persons

<u>Commercial</u>	1176 m2
<u>Industrial - Light</u>	m2
<u>Industrial - Heavy</u>	m2

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	
Residential	280	L/c/d	
Industrial - Light	35,000	L/gross ha/d	
Industrial - Heavy	55,000	L/gross ha/d	
Shopping Centres	2,500	L/(1000m ² /d)	
Hospital	900	L/(bed/day)	
Schools	70	L/(Student/d)	
Trailer Park with no Hook-Ups	340	L/(space/d)	
Trailer Park with Hook-Ups	800	L/(space/d)	
Campgrounds	225	L/(campsite/d)	
Mobile Home Parks	1,000	L/(Space/d)	
Motels	150	L/(bed-space/d)	
Hotels	225	L/(bed-space/d)	
Tourist Commercial	28,000	L/gross ha/d	
Other Commercial	28,000	L/gross ha/d	
AVERAGE DAILY DEMAND	Residential	0.69	L/s
	Commerical/Industrial/ Institutional	0.04	L/s

McINTOSH PERRY

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	4.9	x avg. day	L/c/d
Industrial	1.5	x avg. day	L/gross ha/d
Commercial	1.5	x avg. day	L/gross ha/d
Institutional	1.5	x avg. day	L/gross ha/d
MAXIMUM DAILY DEMAND	Residential	3.38	L/s
	Commerical/Industrial/ Institutional	0.06	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	7.4	x avg. day	L/c/d
Industrial	1.8	x max. day	L/gross ha/d
Commercial	1.8	x max. day	L/gross ha/d
Institutional	1.8	x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	Residential	5.11	L/s
	Commerical/Industrial/ Institutional	0.10	L/s

WATER DEMAND DESIGN FLOWS PER UNIT COUNT

CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

AVERAGE DAILY DEMAND	0.73	L/s
MAXIMUM DAILY DEMAND	3.44	L/s
MAXIMUM HOUR DEMAND	5.21	L/s

McINTOSH PERRY

CCO-22-3715 - 1244 Kilborn - Fire Underwriters Survey Building A

Project: 1244 Kilborn
 Project No.: CCO-22-3715
 Designed By: R.R.R.
 Checked By: R.D.F.
 Date: February 25, 2022

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type **Non-Combustible Construction**

C 0.8 A 5,136.0 m²

Calculated Fire Flow 12,613.2 L/min
 13,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow 11,050.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Fully Supervised Sprinklered -50%

Reduction -5,525.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons. of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	>45	Non-Combustible	138	3	414.0	0%
Exposure 2	30.1 to 45	Non-Combustible	13	2	26.0	5%
Exposure 3	10.1 to 20	Non-Combustible	51.5	4	206.0	15%
Exposure 4	10.1 to 20	Ordinary (Unprotected)	7	2	14.0	10%
						% Increase* 30%

Increase* 3,315.0 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow 8,840.0 L/min
 Fire Flow Required** 9,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CCO-22-3715 - 1244 Kilborn - Fire Underwriters Survey Building B

Project: 1244 Kilborn
 Project No.: CCO-22-3715
 Designed By: R.R.R.
 Checked By: R.D.F.
 Date: February 25, 2022

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
 Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

F = 220 x C x √A Where:
 F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type Non-Combustible Construction

C 0.8 A 6,016.0 m²

Calculated Fire Flow	13,651.1 L/min
	14,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:
 Limited Combustible -15%

Fire Flow	11,900.0 L/min
-----------	----------------

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Fully Supervised Sprinklered -50%

Reduction	-5,950.0 L/min
-----------	----------------

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	10.1 to 20	Non-Combustible	68	4	272.0	15%
Exposure 2	30.1 to 45	Non-Combustible	11	1	11.0	5%
Exposure 3	10.1 to 20	Non-Combustible	14	1	14.0	12%
Exposure 4	10.1 to 20	Ordinary (Unprotected)	7	2	14.0	10%
					% Increase*	42%

Increase*	4,998.0 L/min
-----------	---------------

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow	10,948.0 L/min
Fire Flow Required**	11,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CCO-22-3715 - 1244 Kilborn - Boundary Condition Unit Conversion

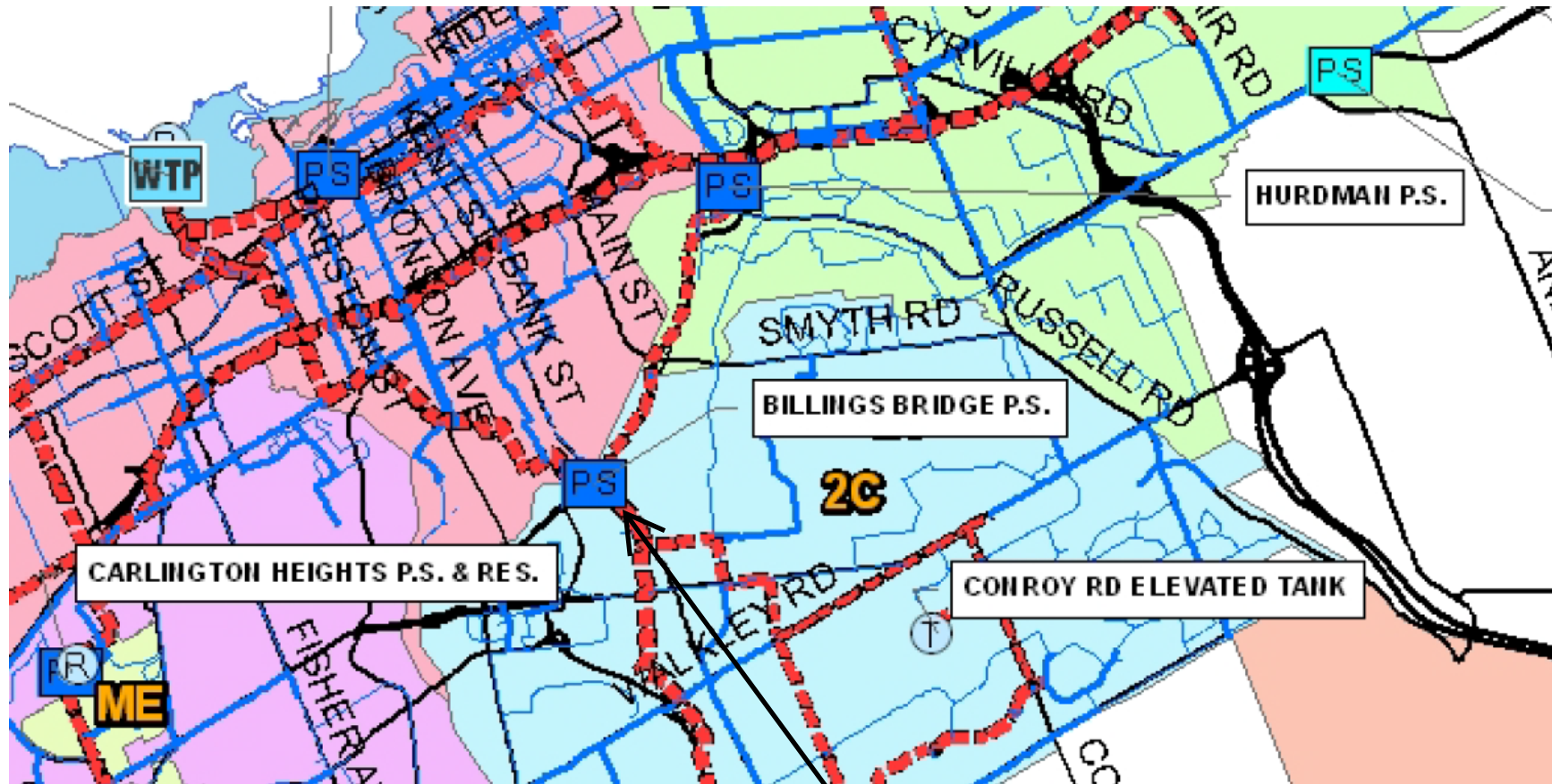
Project: 1244 Kilborn
Project No.: CCO-22-3715
Designed By: R.R.R.
Checked By: R.D.F.
Date: March 3, 2022

Boundary Conditions Unit Conversion

1244 Kilborn

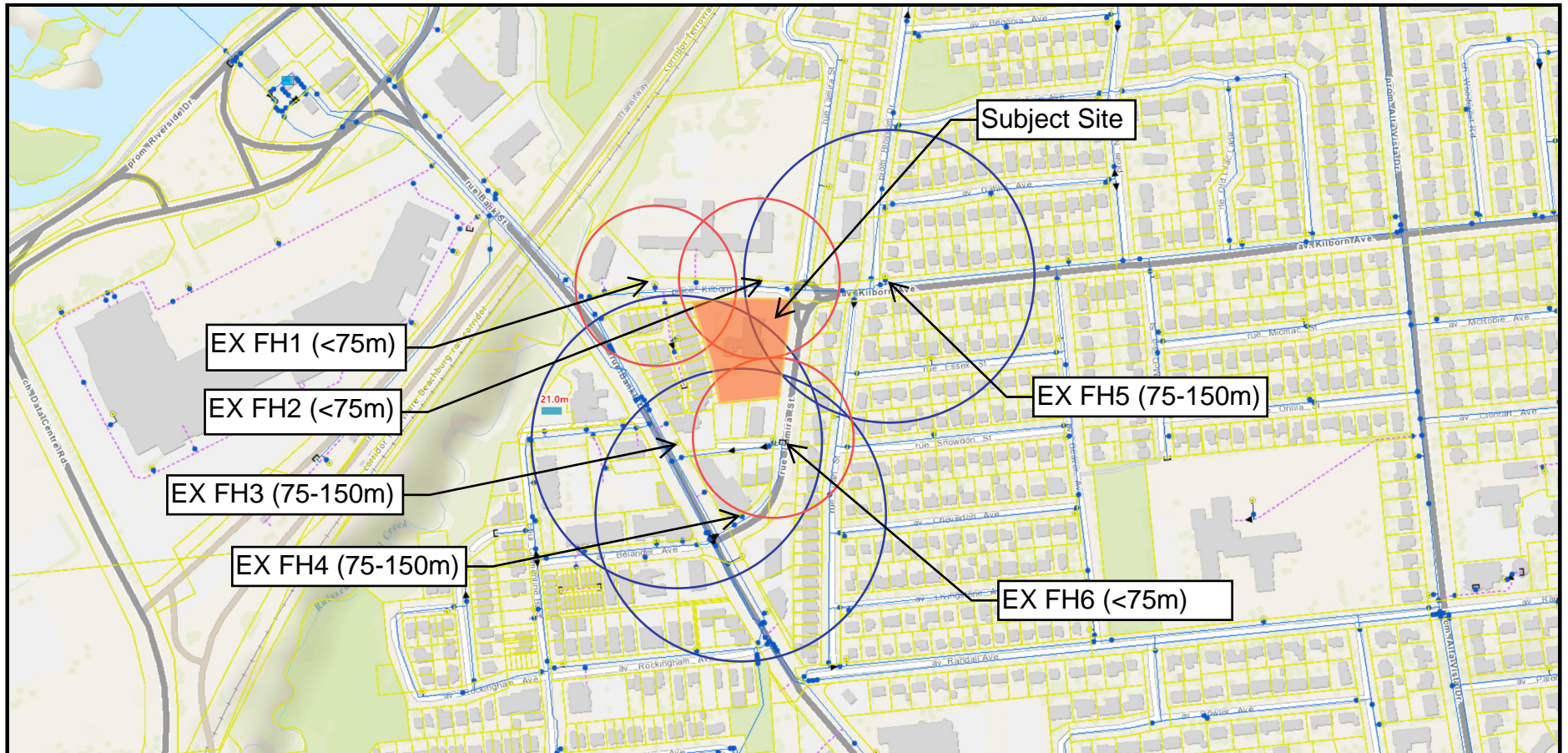
Scenario	Height (m)	Elevation (m)	m H ₂ O	PSI	kPa
Avg. DD	132.0	77.0	55.0	78.3	539.6
Fire Flow (183 L/s or 11,000 L/min)	115.6	77.0	38.6	54.9	378.7
Peak Hour	123.8	77.0	46.8	66.6	459.1

Water Distribution Figure



Approximate site location

Hydrant Coverage Figure 1244 Kilborn Place



Ryan Robineau

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: March 3, 2022 9:37 AM
To: Alison Gosling
Cc: Ryan Robineau
Subject: RE: 22-3715 - 1244 Kilborn - Boundary Conditions
Attachments: 1244 Kilborn Place March 2022.pdf

Hi Alison,

Please find below & attached the boundary conditions for 1244 Kilborn Place.

"The following are boundary conditions, HGL, for hydraulic analysis at 1244 Kilborn Place (zone 2W2C) assumed to be a dual connection to the 203 mm watermain on Kilborn Place. (see attached PDF for location).

Minimum HGL: 123.8 m

Maximum HGL: 132.0 m

Max Day + Fire Flow (183.33 L/s): 115.6 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.

Please let me know if you require anything else.

Thank you,

Tyler Cassidy, EIT

Infrastructure Project Manager,

Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Alison Gosling <a.gosling@mcintoshperry.com>
Sent: February 28, 2022 12:35 PM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Cc: Ryan Robineau <r.robineau@mcintoshperry.com>
Subject: 22-3715 - 1244 Kilborn - Boundary Conditions

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

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Good afternoon Tyler,

We would like to request boundary conditions for 1244 Kilborn Place. The contemplated development contains two new 4-storey mixed-use buildings.

- The estimated fire flow is 11,000 L/min, based on the FUS calculations (attached).
- Average daily demand: 0.73 L/s.
- Maximum daily demand: 3.44 L/s.
- Maximum hourly daily demand: 5.21 L/s.

Attached is a map showing the proposed connection location along with the calculations prepared for the demands listed above.

Please let me know if you have any questions.

Thank you,

Alison Gosling, P.Eng.

Project Engineer, Land Development

T. 613.714.4629

a.gosling@mcintoshperry.com | www.mcintoshperry.com

McINTOSH PERRY

Turning Possibilities Into Reality

Confidentiality Notice – If this email wasn't intended for you, please return or delete it. Click [here](#) to read all of the legal language around this concept.

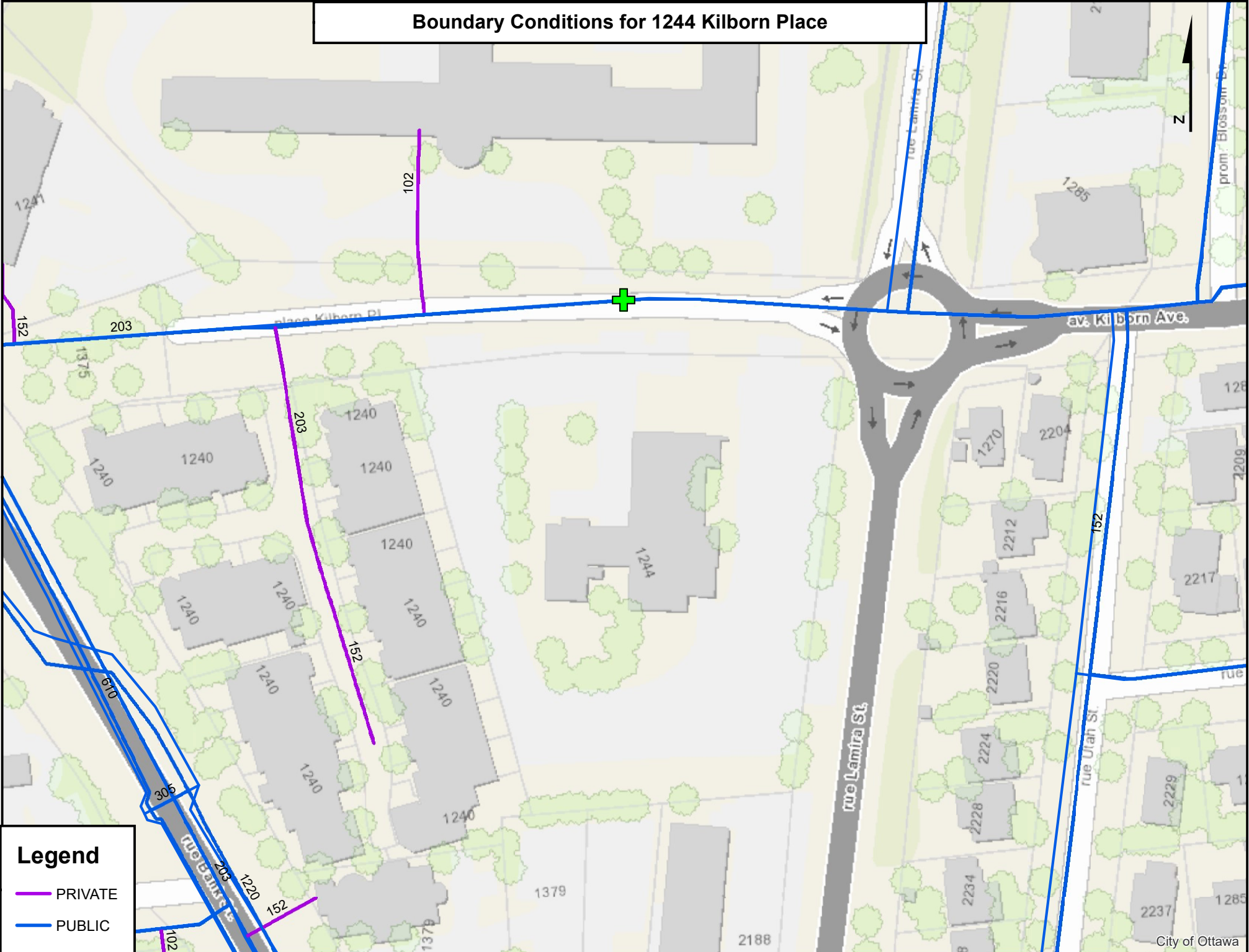


Platinum
member

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

Boundary Conditions for 1244 Kilborn Place



Legend

- PRIVATE
- PUBLIC

APPENDIX D
SANITARY CALCULATIONS

McINTOSH PERRY

CCO-22-3715 - 1244 Kilborn - Sanitary Demands

Project:	1244 Kilborn		
Project No.:	CCO-22-3715		
Designed By:	R.R.R.		
Checked By:	R.D.F.		
Date:	11/12/2021		
Site Area	0.85	Gross ha	
Duplex	0	2.30	Persons per unit
Apartment	118	1.80	Persons per unit
Total Population	213	Persons	
Commercial Area	1176.00	m ²	
Amenity Space	711.00	m ²	

DESIGN PARAMETERS

Institutional/Commercial Peaking Factor	1.5	*Check technical bulleting (Either use 1.0 or 1.5)
Residential Peaking Factor	3.51	* Using Harmon Formula = $1+(14/(4+P^{0.5})) * 0.8$ where P = population in thousands, Harmon's Correction Factor = 0.8
Mannings coefficient (n)	0.013	
Demand (per capita)	280	L/day
Infiltration allowance	0.33	L/s/Ha

EXTRANEOUS FLOW ALLOWANCES

Infiltration / Inflow	Flow (L/s)
Dry	0.04
Wet	0.24
Total	0.28

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	280	L/c/d	213	0.69
Industrial - Light**	35,000	L/gross ha/d		0
Industrial - Heavy**	55,000	L/gross ha/d		0
Commercial / Amenity	2,800	L/(1000m ² /d)	1887.00	0.06
Hospital	900	L/(bed/day)		0
Schools	70	L/(Student/d)		0
Trailer Parks no Hook-Ups	340	L/(space/d)		0
Trailer Park with Hook-Ups	800	L/(space/d)		0
Campgrounds	225	L/(campsite/d)		0
Mobile Home Parks	1,000	L/(Space/d)		0
Motels	150	L/(bed-space/d)		0
Hotels	225	L/(bed-space/d)		0
Office	75	L/7.0m ² /d		0
Tourist Commercial	28,000	L/gross ha/d		0
Other Commercial	28,000	L/gross ha/d		0

McINTOSH PERRY

AVERAGE RESIDENTIAL FLOW	0.69	L/s
PEAK RESIDENTIAL FLOW	2.42	L/s
AVERAGE ICI FLOW	0.06	L/s
PEAK INSTITUTIONAL/COMMERCIAL FLOW	0.09	L/s
PEAK INDUSTRIAL FLOW	0.00	L/s
TOTAL PEAK ICI FLOW	0.09	L/s

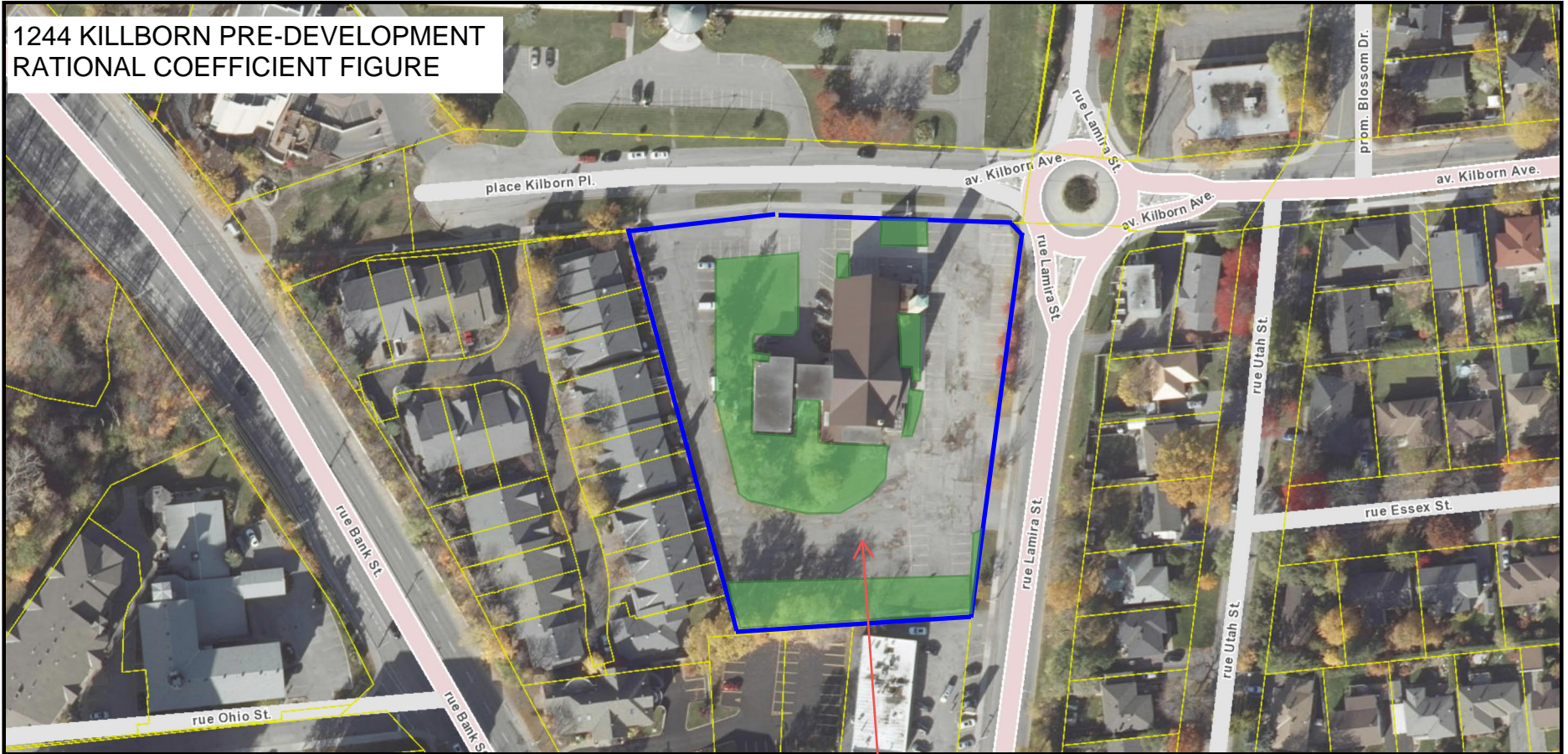
TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	0.79	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	2.56	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	2.80	L/s

** PEAK INDUSTRIAL FLOW PER CITY OF OTTAWA SEWER DESIGN GUIDELINES APPENDIX 4B

APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

1244 KILLBORN PRE-DEVELOPMENT
RATIONAL COEFFICIENT FIGURE



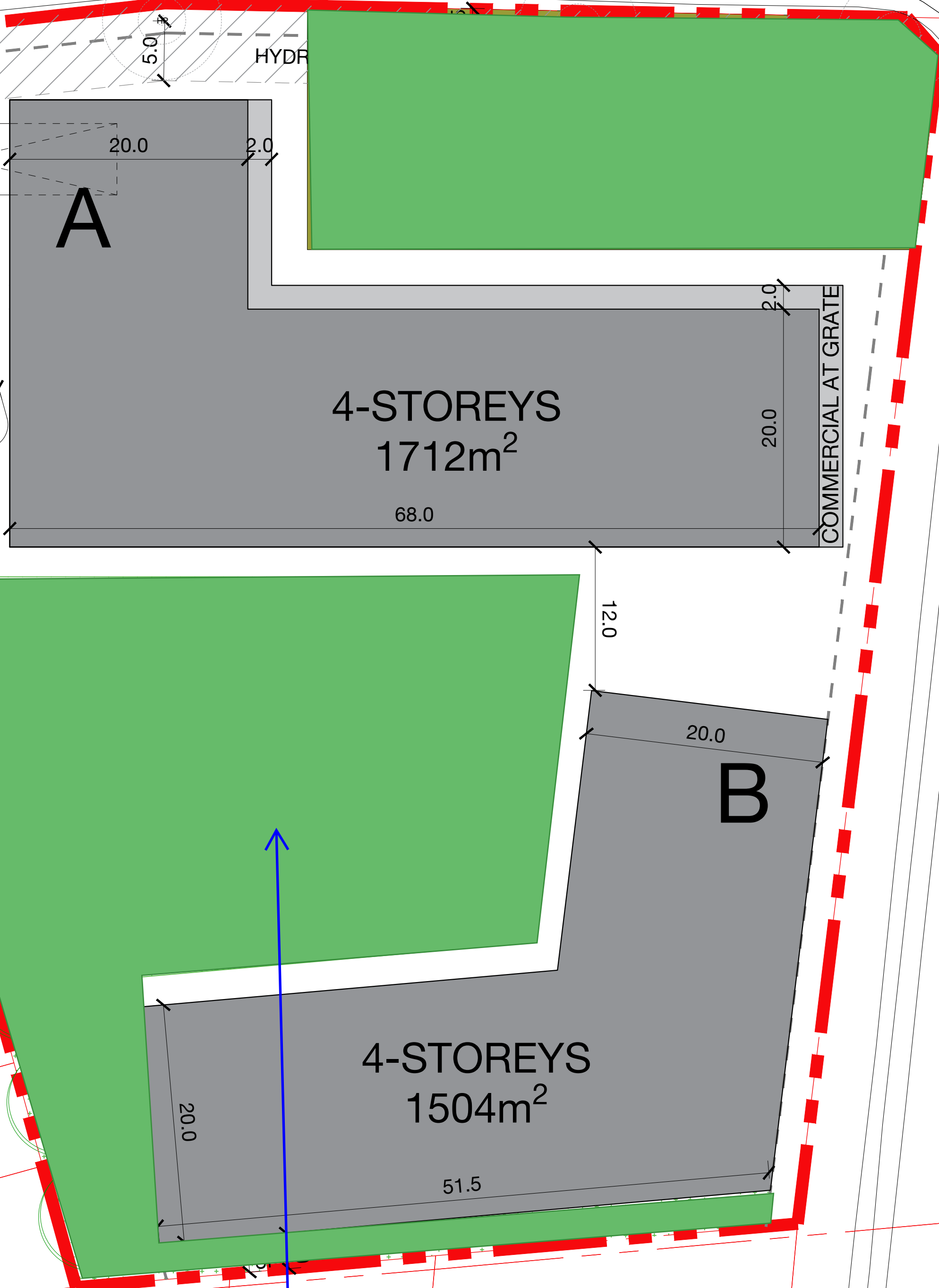
TOTAL SITE AREA = 8503m²
PERVIOUS AREA WITHIN SITE
(GREEN) = 2072m²
IMPERVIOUS AREA WITHIN SITE =
6431m²

APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

1244 KILBORN POST- DEVELOPMENT
RATIONAL COEFFICIENT

KILBORN PL

LAMIRA ST



TOTAL SITE AREA = 8503m²
PERVIOUS AREA WITHIN SITE (GREEN) = 3185m²
IMPERVIOUS AREA WITHIN SITE = 5318m²

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

Pre-Development Runoff Coefficient

Drainage Area	Area (ha)	Impervious Area (m ²)	C	Gravel Area (m ²)	C	Pervious Area (m ²)	C	C _{AVG} 2/5-Year	C _{AVG} 100-Year
A1	0.850	6,431.00	0.90	0.00	0.60	2,072.00	0.20	0.73	0.82

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 2/5-Year	C 100-Year	Tc (min)	I (mm/hr)			Q (L/s)		
					2-Year	5-Year	100-Year	2-Year	5-Year	100-Year
A1	0.850	0.73	0.82	10	76.8	104.2	178.6	132.43	179.65	344.94
Total	0.850							132.43	179.65	344.94

Post-Development Runoff Coefficient

Drainage Area	Area (ha)	Impervious Area (m ²)	C	Gravel Area (m ²)	C	Pervious Area (m ²)	C	C _{AVG} 2/5-Year	C _{AVG} 100-Year
B1	0.765	4,786.20	0.90	0.00	0.60	2,866.50	0.20	0.64	0.72
B2	0.085	531.80	0.90	0.00	0.60	318.50	0.20	0.64	0.72

Controlled
Uncontrolled

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 2/5-Year	C 100-Year	Tc (min)	I (mm/hr)		Q (L/s)	
					5-Year	100-Year	5-Year	100-Year
B1	0.765	0.64	0.72	10	104.2	178.6	141.38	273.16
B2	0.085	0.64	0.72	10	104.2	178.6	15.71	30.35
Total	0.850						157.09	303.51

Required Restricted Flow

Drainage Area	Area (ha)	C 5-Year	Tc (min)	I (mm/hr)	Q (L/s)
				5-Year	5-Year
A1	0.850	0.50	10	104.2	123.15
Total	0.850				123.15

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/s)		Restricted Flow (L/s)		Storage Required (m ³)		Storage Provided (m ³)	
	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year
B1	141.38	273.16	48.03	92.80	58.74	113.16	58.74	113.16
B2	15.71	30.35	15.71	30.35				
Total	157.09	303.51	63.74	123.15	58.74	113.16	58.74	113.16

Restricted
Unrestricted

McINTOSH PERRY

CCO-22-3715 - 1244 Kilborn - Runoff Calculations

1 of 2

Storage Requirements for Area B1

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	141.38	48.03	93.35	56.01
12	94.7	128.49	48.03	80.46	57.93
14	86.9	117.96	48.03	69.93	58.74
16	80.5	109.17	48.03	61.14	58.70
18	75.0	101.73	48.03	53.70	57.99

Maximum Storage Required 5-year = 58.7 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	273.16	92.80	180.36	108.21
12	162.1	248.03	92.80	155.23	111.76
14	148.7	227.51	92.80	134.71	113.16
16	137.5	210.42	92.80	117.62	112.92
18	128.1	195.94	92.80	103.14	111.39
20	120.0	183.50	92.80	90.70	108.84
22	112.9	172.68	92.80	79.88	105.45
24	106.7	163.19	92.80	70.39	101.36
26	101.2	154.78	92.80	61.98	96.69
28	96.3	147.28	92.80	54.48	91.53

Maximum Storage Required 100-year = 113.2 m³

5-Year Storm Event Storage Summary

Storage Available (m³) = 58.7

Storage Required (m³) = 58.7

100-Year Storm Event Storage Summary

Storage Available (m³) = 113.2

Storage Required (m³) = 113.2

APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST

City of Ottawa

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

Criteria	Location (if applicable)
<input type="checkbox"/> Executive Summary (for larger reports only).	N/A
<input type="checkbox"/> Date and revision number of the report.	On Cover
<input type="checkbox"/> Location map and plan showing municipal address, boundary, and layout of proposed development.	Appendix A
<input type="checkbox"/> Plan showing the site and location of all existing services.	Site Servicing Plan (C102)
<input type="checkbox"/> 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.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
<input type="checkbox"/> Summary of pre-consultation meetings with City and other approval agencies.	Appendix B
<input type="checkbox"/> 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.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
<input type="checkbox"/> Statement of objectives and servicing criteria.	3.0 Pre-Consultation Summary

<input type="checkbox"/> Identification of existing and proposed infrastructure available in the immediate area.	N/A
<input type="checkbox"/> 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).	N/A
<input type="checkbox"/> Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management 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.	N/A
<input type="checkbox"/> 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.	N/A
<input type="checkbox"/> Proposed phasing of the development, if applicable.	N/A
<input type="checkbox"/> Reference to geotechnical studies and recommendations concerning servicing.	Section 2.0 Background Studies, Standards and References
<input type="checkbox"/> All preliminary and formal site plan submissions should have the following information: <ul style="list-style-type: none"> ○ Metric scale ○ North arrow (including construction North) ○ Key plan ○ Name and contact information of applicant and property owner ○ Property limits including bearings and dimensions ○ Existing and proposed structures and parking areas ○ Easements, road widening and rights-of-way ○ Adjacent street names 	N/A

4.2 Development Servicing Report: Water

Criteria	Location (if applicable)
<input type="checkbox"/> Confirm consistency with Master Servicing Study, if available	N/A
<input type="checkbox"/> Availability of public infrastructure to service proposed development	N/A
<input type="checkbox"/> Identification of system constraints	N/A
<input type="checkbox"/> Identify boundary conditions	Appendix C
<input type="checkbox"/> Confirmation of adequate domestic supply and pressure	N/A
<input type="checkbox"/> 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 at locations throughout the development.	Appendix C
<input type="checkbox"/> 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.	N/A
<input type="checkbox"/> Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
<input type="checkbox"/> Address reliability requirements such as appropriate location of shut-off valves	N/A
<input type="checkbox"/> Check on the necessity of a pressure zone boundary modification.	N/A
<input type="checkbox"/> 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	Appendix C, Section 4.2

<input type="checkbox"/> Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	N/A
<input type="checkbox"/> 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.	N/A
<input type="checkbox"/> Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Appendix C
<input type="checkbox"/> Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

Criteria	Location (if applicable)
<input type="checkbox"/> Summary of proposed design criteria (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).	N/A
<input type="checkbox"/> Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
<input type="checkbox"/> 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 condition of sewers.	N/A
<input type="checkbox"/> Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 5.2 Proposed Sanitary Sewer

<input type="checkbox"/> 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)	Section 5.3 Proposed Sanitary Design
<input type="checkbox"/> Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	N/A
<input type="checkbox"/> Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 5.2 Proposed Sanitary Sewer
<input type="checkbox"/> 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).	N/A
<input type="checkbox"/> Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
<input type="checkbox"/> Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
<input type="checkbox"/> Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
<input type="checkbox"/> Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

Criteria	Location (if applicable)
<input type="checkbox"/> Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Analysis of available capacity in existing public infrastructure.	N/A
<input type="checkbox"/> A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Pre & Post-Development Plans
<input type="checkbox"/> Water quantity 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.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Set-back from private sewage disposal systems.	N/A
<input type="checkbox"/> Watercourse and hazard lands setbacks.	N/A
<input type="checkbox"/> Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
<input type="checkbox"/> Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
<input type="checkbox"/> Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5-year return period) and major events (1:100-year return period).	Appendix G

<input type="checkbox"/> Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Site Grading Plan
<input type="checkbox"/> 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.	Section 7.0 Proposed Stormwater Management Appendix G
<input type="checkbox"/> Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> 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.	N/A
<input type="checkbox"/> Identification of potential impacts to receiving watercourses	N/A
<input type="checkbox"/> Identification of municipal drains and related approval requirements.	N/A
<input type="checkbox"/> Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> 100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
<input type="checkbox"/> Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A

<input type="checkbox"/> Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 8.0 Sediment & Erosion Control
<input type="checkbox"/> Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
<input type="checkbox"/> Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 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:

Criteria	Location (if applicable)
<input type="checkbox"/> 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 the 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.	N/A
<input type="checkbox"/> Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
<input type="checkbox"/> Changes to Municipal Drains.	N/A
<input type="checkbox"/> Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

Criteria	Location (if applicable)
<input type="checkbox"/> Clearly stated conclusions and recommendations	Section 9.0 Summary Section 10.0 Recommendations
<input type="checkbox"/> 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 are stamped
<input type="checkbox"/> All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	All are stamped