

SERVICING AND STORMWATER MANAGEMENT REPORT KANATA AVENUE – THE WOODS



Perspective Prepared by S.J. Lawrence Architect Incorporated

MP Project No.: CCO-21-3764

City File No.: D07-

Prepared for:

Theberge Developments Ltd.

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June 30th, 2021

McINTOSH PERRY

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by Theberge Developments Ltd. to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the proposed mixed use building consisting of residential and commercial uses located at 180 Kanata Avenue within the City of Ottawa.

The main purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the City of Ottawa (City), the Mississippi Valley Conservation Authority (MVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

This report should be read in conjunction with the following drawings:

- 000-21-3764, C101 – Site Grading, Drainage and Erosion & Sediment Control Plan, and
- 000-21-3764, C102 – Site Servicing Plan.

1.2 Site Description

The property is located at 180 Kanata Avenue, within the City of Ottawa. It is described as Part of Lot 3, Concession 2, Geographic Township of March, City of Ottawa. The developable land in question covers approximately 1.1 ha and is located on the north side of Kanata Avenue between Earl Grey Drive and Maritime Way. The existing site is currently undeveloped with vegetation throughout the entire site area.

Adjacent to the property on all sides is undeveloped land except for the southern property line which is fronting onto Kanata Avenue.

The proposed development consists of a six storey building with commercial on the ground floor. The total building area is 5,043 m² and there will be two levels of underground parking. The remainder of the site will consist of landscaped areas and amenity space. A new road will be extended from Kanata Avenue to provide vehicular access to the site. The new road will be located directly across from the entrance to the parking area for the Kanata Centrum. Another development located to the east will make use of this new road. Detailed design documents have been provided by others and can be found under separate cover.

A site location plan has been provided in Appendix A for reference.

2.0 BACKGROUND STUDIES

Background studies that have been completed for the site include a review of the City of Ottawa as-built drawings, master servicing studies, a topographical survey of the site, an Environmental Impact Study, a geotechnical report and a Phase I Environmental Site Assessment (ESA).

As-built drawings of the existing services within the vicinity of the site were reviewed in order to determine proper servicing and stormwater management schemes for the site.

Master servicing reports for the area have been previously completed for the area and identify stormwater management criteria. The reviewed reports were:

- Kanata Town Centre, Central Business District, Stormwater Management Report (J.L. Richards, January 1999)
- Servicing Brief (Revised) – Kanata Town Centre Central Business District Subdivision, Technical Memorandum (J.L. Richards, June 13, 2012).

A topographic survey of the site was completed by Farley, Smith & Denis Surveying Ltd. dated May 3rd, 2021 and can be found under separate cover.

The following reports have been completed for the development and are available under separate cover:

- Geotechnical Investigation completed by Paterson Group dated April 21, 2021.
- Phase I ESA completed by EXP. dated June 30, 2021.
- Traffic Impact Study completed by McIntosh Perry Consulting Engineers Ltd.

3.0 PRE-CONSULTATION SUMMARY

City of Ottawa Staff have been pre-consulted regarding this proposed development. Specific design parameters to be incorporated within this design include the following:

- Stormwater management to be in compliance with the master servicing studies for the area;
- Flows to the storm sewer in excess of the allowable release rate, up to and including the 100-year storm event, must be detained on site;
- New sanitary and water pipes are to be extended from stubs within Kanata Avenue within the new road;
- Storm service connections can be made to Kanata Avenue;
- Quality control of storm runoff must be confirmed with MVCA, and
- Sanitary capacity will need to be demonstrated.

Pre-Consultation notes from the City can be found in Appendix 'B'.

4.0 EXISTING SERVICES

The following services are located within Kanata Avenue:

- 610 mm backbone watermain and 305 mm watermain (stubbed at property line)
- 750 mm trunk sanitary sewer main and 250 mm sanitary main (stubbed at property line)
- 450, 525 and 675 mm storm sewer main

The 305 mm watermain and 250 mm sanitary main have been stubbed at the location for the new road extension. These services will be extended north in order to service the development.

In addition to the services within the roadway, there is also fire hydrants along the north side of Kanata Avenue that are available for fire protection.

5.0 SERVICING PLAN

5.1 Proposed Servicing Overview

The overall servicing will be provided via service connections to the extended mains within the new roadway from Kanata Avenue. The water service will be extended from the 305 mm diameter watermain. Similarly, the sanitary service will be connected to the 250 mm sanitary main. The storm service will be connected to the 525 mm storm main within Kanata Avenue and a new storm main within the new roadway.

Details pertaining to the final proposed servicing locations have been reviewed and are shown on the proposed Site Servicing Plan included within the submission package.

5.2 Proposed Water Design

Two new water services (200 mm PVC and 50 mm copper) will be brought into the building from the new 305 mm PVC watermain within the extended roadway from Kanata Avenue, complete with a water valve located at the property line as well as water valve located between the two connection points along the proposed main. The existing fire hydrants within Kanata Avenue will be used to service the site and will be located within 45 m of the siamese connection located on the building. The water service is designed to have a minimum of 2.4m of cover.

The Fire Underwriters Survey 1999 (FUS) method was utilized to determine the required fire flow for the site. The 'C' factor (type of construction) for the FUS calculation was determined to be 0.8 (non-combustible type construction). The total floor area ('A' value) for the FUS calculation was determined to be 5,043 m². The results of the calculations yielded a required fire flow of 23,000 L/min. A fire flow of 9,000 L/min was calculated using the Ontario Building Code (OBC) requirements. The detailed calculations for the FUS and OBC can be found in Appendix 'C'.

The water demands for the proposed building 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:

Table 1: Water Demands

Ste Area	1.11 ha
Residential	350 L/c/d
Other Commercial	28,000 L/ha/day

Average Day Demand (L/s)	2.08
Maximum Daily Demand (L/s)	4.85
Peak Hourly Demand (L/s)	10.45
OBC Fire Flow Requirement (L/s)	60.00
FUS Fire Flow Requirement (L/s)	166.67
Max Day + Fire Flow (FUS) (L/s)	167.41

Boundary conditions were not available at the time of submission, therefore a water model, hydrant flow and updated report will be completed when this information is received.

5.3 Proposed Sanitary Design

A new 200 mm diameter gravity sanitary service will be connected to the new 250 mm diameter sewer within the proposed road extension. The sanitary service will be complete with a maintenance manhole (MH1A) just inside the property line as per the City of Ottawa – Sewer Design Guidelines, October 2012, Clause 4.4.4.7 and City of Ottawa Sewer-Use By-Law 2003-514 (14).

The proposed 200mm diameter gravity sanitary service will be installed with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. Design parameters for the site include an infiltration rate of 0.33 L/s/ha.

The subject site is a proposed mixed use building consisting of residential and commercial spaces. The total area of the building is 5,043 m². The peak design flows for the proposed building were calculated using criteria from the City of Ottawa – Sewer Design Guidelines, October 2012. The peak design flow for the proposed site was determined to be 1.69 L/s, therefore the proposed 200 mm diameter lateral has sufficient capacity to convey the flows (See Appendix ‘D’ for detailed calculations). It is anticipated that there will be no issues with capacity constraints within the proposed lateral, the new main or within the existing sanitary main within Kanata Avenue as the amount of flow leaving the site is minimal.

Refer to Appendix ‘D’ for sanitary calculations.

5.4 Proposed Storm Design

Stormwater runoff will be conveyed by way of roof drainage, overland sheet flow and a proposed storm sewer network. Runoff will be concentrated within the roof, landscaped areas and asphalt areas where it will flow towards the proposed catchbasins to then be conveyed through the on-site stormwater system to the existing 525 mm storm sewer within Kanata Avenue. The site will be constructed with adequate grading to ensure that all areas on the site are able to reach a suitable outlet and to ensure that the post-development restriction is achieved. Please see the Lot Grading, Drainage and Sediment & Erosion Control Plan for detailed locations of

the proposed stormwater infrastructure. The direction and location of overland sheet flow has also been indicated.

Stormwater management (SWM) design for the site will make use of the roof to restrict flows prior to discharging to the City's storm network. The intent of the overall stormwater management design is to provide a system capable of capturing runoff, restricting flows to allowable flow rate, and providing the on-site storage necessary to accommodate the reduced runoff rate. In the event of a failure or blockage within the system, stormwater will be conveyed to Kanata Avenue and the new roadway. The stormwater management design will be further detailed in Section 6.0.

6.0 PROPOSED STORMWATER MANAGEMENT

6.1 Design Criteria and Methodology

Stormwater management for this site will be maintained through positive drainage away from the proposed building and a new storm sewer system within the site. This SWM plan will implement quantity control strategies. The storm runoff will enter the pipe system through roof drains, catchbasins (CB's) and catchbasin manholes (CBMH's) located throughout the site. The restricted stormwater runoff will be directed to the existing sewer within Kanata Avenue and the new storm main in the extended roadway; similarly, overland flow will be directed towards Kanata Avenue through the proposed drainage patterns. The quantitative and qualitative properties of the storm runoff for both the pre- and post-development flows are further detailed below. Stormwater Best Management Practices (SWM BMP's) will be implemented at the "Lot level", "Conveyance" and "End of Pipe" locations. These concepts will be explained further in Section 6.3. In summary, the following design criteria have been employed in developing the stormwater management design for the site as directed by the MVCA and the City:

Quality Control

- No quality control is required. Quality control will be provided downstream of the site in the stormwater management facility constructed as part of the Urbandale Kanata Town Centre Development.

Quantity Control

- Stormwater management (SWM) design criteria for the proposed development were established by Kanata Town Centre, Central Business District, Stormwater Management Report (J.L. Richards, January 1999) and Servicing Brief (Revised) – Kanata Town Centre Central Business District Subdivision, Technical Memorandum (J.L. Richards, June 13, 2012). The SWM design criteria are as follows:
- Control post-development peak flows up-to and including the 100-year storm event to the allowable release rate. Provide on-site water quantity control for all flow in excess of the allowable release rate.

- The allowable release rate is to be determined by applying the following parameters to the site area:
 - A runoff coefficient of 0.8
 - A time of concentration of 20 minutes
 - A 5-year intensity using the City of Ottawa Intensity-Duration-Frequency (IDF) curves

6.2 Runoff Calculations

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

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

Where

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

It is recognized that the rational method tends to overestimate runoff rates. As a by-product of using extremely conservative prediction method, any facilities that are sized using these results are expected to function as intended in real world conditions.

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

Roofs/ Concrete/ Asphalt	0.90
Gravel*	0.60
Undeveloped and Grass	0.20

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

The time of concentration (Tc) used for pre-development was calculated and found to be less than 10 minutes, therefore, pre-development flows shall be calculated using a minimum time of concentration (Tc) of 10 minutes and post-development flows shall be calculated using a time of concentration (Tc) of 10 minutes.

6.2.1 Pre-Development Drainage

The existing site has been demonstrated as drainage areas A1. The Pre-development Drainage Area Plan indicates the limits of the drainage area, see COO-21-3764 – PRE in Appendix 'E' of this report for more details. Drainage area A1 represents the flow that goes to the Kanata Avenue right of way. The development area is covered entirely with vegetation. A summary of the pre-development runoff calculations can be found below.

Table 2: Pre-Development Runoff Summary

Area ID	Drainage Area (ha)	5-Year Runoff Coefficient	100-Year Runoff Coefficient	T _c (min)	Unrestricted 5-year Peak Flow (L/s)	Unrestricted 100-year Peak Flow (L/s)
A1	1.11	0.20	0.25	10	64.51	138.20
Total	1.11				64.51	138.20

See CP-20-0023 – PRE in Appendix ‘E’ and Appendix ‘G’ for calculations

6.2.2 Post-Development Drainage

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See 000-21-3764 – POST in Appendix ‘F’ of this report for more details. A summary of the Post-Development Runoff Calculations can be found below.

Table 3: Post-Development Runoff Summary

Area ID	Drainage Area (ha)	5-Year Runoff Coefficient	100-Year Runoff Coefficient	T _c (min)	Unrestricted 5-year Peak Flow (L/s)	Unrestricted 100-year Peak Flow (L/s)
B1	0.396	0.40	0.47	10	46.44	92.29
B2	0.210	0.78	0.87	10	47.53	91.00
B3	0.508	0.90	1.00	10	132.30	251.92
Total	1.11				226.27	435.21

See CP-20-0023 – POST in Appendix ‘F’ and Appendix ‘G’ for calculations

Runoff from the landscaped area of the site will be captured and conveyed to the existing 525 mm storm sewer within Kanata Avenue whereas the parking area and building will discharge to the new 450 mm storm main within the new roadway.

In order to match pre-development flows, on site storage will be required. Storage will be provided on the roof via restricted roof drains. All other areas of the site will discharge unrestricted from the site. See Appendix ‘G’ for calculations.

6.3 Quantity Control

After reviewing the master drainage reports for the area, the total post-development runoff for this site has been restricted to match the 5-year pre-development flow rate with a C value of 0.8. (See Appendix ‘B’ for pre-consultation notes). These values create the following allowable release rates and storage volumes for the development site.

Table 4: Allowable Release Rate

Area ID	Drainage Area (ha)	Runoff Coefficient	T _c (min)	Required Restricted Flow 5-year (L/s)
A1	1.11	0.8	10	258.05
Total	1.11			258.05

See Appendix 'G' for calculations

Reducing site flows will be achieved using flow restriction on the roof and will create the need for onsite storage. Runoff from area B3 will be restricted as detailed in the table below.

Table 5: Post-Development Restricted Runoff

Area ID	Drainage Area (ha)	5-Year Runoff Coefficient	100-Year Runoff Coefficient	T _c (min)	Restricted 5-year Peak Flow (L/s)	Restricted 100-year Peak Flow (L/s)	Restricted/Unrestricted
B1	0.396	0.40	0.47	10	46.44	92.29	Unrestricted
B2	0.210	0.78	0.87	10	47.53	91.00	Unrestricted
B3	0.508	0.90	1.00	10	4.32	8.10	Restricted
Total	1.11				98.29	191.39	

See Appendix 'G' for calculations

Runoff from Area B3 will be restricted via nine roof drains located on the roof. The roof drains will restrict the stormwater runoff to 4.32 L/s and 8.10 L/s for the 5 and 100 year storm events with ponding depths of 40 mm and 75 mm respectively. The restricted flow from the roof will flow towards the new storm main within the new roadway on the east side of the building through a 200 mm lateral. The roof restriction will account for the landscaped and parking areas leaving the site unrestricted. Table 6 details the required and provided storage volumes for the site.

In the event that there is rainfall above the 100-year storm event, or a blockage within the storm network occurs, an emergency overland flow route has been provided for the entire site such that the storm water runoff will be conveyed away from the building and off of the site towards the new roadway and Kanata Avenue. The water surface elevation (WSEL) will reach 101.00 providing a 0.5 m freeboard separation from the finished floor elevation of 101.50 and 0.2 m freeboard from the entrance to the underground parking. The WSEL will reach 101.20 in the landscaped area providing a 0.3 m freeboard separation from the finished floor elevation.

The following table summarizes the storage requirements during the 5 and 100-year storm events and the provided storage volumes.

Table 6: Storage Summary

Drainage Area	Depth of Ponding (m)	Storage Required (m ³)	Storage Available (m ³)	Depth of Ponding (m)	Storage Required (m ³)	Storage Available (m ³)
	5-Year			100-Year		
B3	0.040	148.1	152.3	0.075	277.7	285.5

See Appendix 'G' for calculations

6.4 Quality Control

The development of this lot will employ Best Management Practices (BMP's) wherever possible. The intent of implementing stormwater BMP's is to ensure that water quality and quantity concerns are addressed at all stages of development. Lot level BMP's typically include temporary retention of the parking lot runoff, minimizing ground slopes and maximizing landscaped areas. Some of these BMP's cannot be provided for this site due to site constraints and development requirements.

As per the discussions with the MVCA, the existing storm main within Kanata Avenue ties into a downstream stormwater management facility which provides appropriate quality control for the site. This facility has been designed to accommodate runoff from Kanata Avenue within the tributary drainage area. Therefore, no additional on-site quality treatment has been provided.

7.0 SEDIMENT EROSION CONTROL

7.1 Temporary Measures

Before construction begins, temporary silt fence will be installed at all-natural runoff outlets from the property. For this project, areas of concern include the roadside CB's along the property line where runoff and sheet flow may leave the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

Silt fences will be installed where shown on the final engineering plans, specifically along the downstream property limits. The Contractor, at their discretion or at the instruction of the City of Ottawa, MVCA or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way off site. The silt fence and barriers shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences as required. Geosock is to be installed under the grates of all existing structures along the frontage of the site and any new structures immediately upon installation. The Geosock is to be removed only after all areas have been paved. Care shall be taken at the removal stage to ensure that any silt that has accumulated is properly handled and disposed of. Removal of silt fences without prior removal of the sediments shall not be permitted.

Although not anticipated, work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the MVCA to review the site conditions and determine the appropriate course of action. As the ground begins to thaw, the Contractor shall place silt fencing at all required locations as soon as ground conditions both warrant and permit. Please see the Site Grading and Drainage Plan for additional details regarding the temporary measures to be installed and their appropriate OPSD references.

7.2 Permanent Measures

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

8.0 SUMMARY

- A new 5,043 m² six storey mixed use residential/commercial building will be constructed on the site located at 180 Kanata Avenue;
- A new roadway will be constructed from Kanata Avenue to provide servicing for the site;
- A new 250 mm diameter sanitary sewer and manhole will be installed within the new roadway;
- A new 450 mm diameter storm sewer and manhole will be installed within the new roadway;
- A new 300 mm diameter watermain will be installed within the new roadway;
- The building will be serviced with a new 200 mm diameter sanitary lateral, 200 mm and 50 mm diameter water laterals and 200 mm diameter storm (roof and foundation) laterals all connected to the new roadway;
- A 300 mm diameter connection to the storm sewer within Kanata Avenue will be made to accommodate flows from the landscape area along the north and west sides of the building;
- As discussed with the City of Ottawa staff, the stormwater management design will ensure that the post-development flow rates are restricted to the 5-year pre-development flow rate calculated with a C value of 0.8.
- Storm restriction and stormwater storage for the 5 through 100-year storm events will be provided on the roof; and
- The stormwater management facility located downstream has been previously constructed to provide appropriate quality control for the site as per the MVCA.

9.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that City of Ottawa approve this Servicing and Stormwater Management Report in support of the proposed mixed use development at 180 Kanata Avenue.

The sediment and erosion control plan outlined in Section 7.0 and detailed in the Grading and Drainage Plan notes are to be implemented by the contractor.

This report is respectfully being submitted for approval.

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10.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of Theberge Developments Ltd.. 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 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
SITE LOCATION MAP



Site Location

LEGEND

-  Site Location
-  Local Road
-  Major Road

CLIENT:		
Theberge Developments Ltd.		
PROJECT:		
The Woods		
TITLE:		
SITE LOCATION		
McINTOSH PERRY <small>115 Walgreen Road, RR3, Carp, ON K0A1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com</small>	PROJECT NO:	FIGURE:
	Date	1
	GIS	
	Checked By	CJM

APPENDIX B
CITY OF OTTAWA PRE-CONSULTATION NOTES

Site Plan Pre- Application Consultation Notes

Date: Monday, February 8, 2021

Site Location: 6905 Campeau Drive

Type of Development: Residential (townhomes, stacked, singles, apartments), Office Space, Commercial, Retail, Institutional, Industrial, Other: N/A

Infrastructure

Existing Services on Kanata Avenue:

- 610 mm backbone watermain
- 305 mm watermain
- 750 mm trunk sanitary sewer main
- 250 mm sanitary main
- 675 mm storm sewer main

Recommendations: The existing 305mm watermain and 205mm sanitary sewer mains should be extended on the future street and serviced within the development. The storm service connections can be connected on Kanata Avenue.



Watermain Comments

Watermain Frontage Fees to be paid (\$190.00 per metre) Yes No

Boundary conditions:

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(s) and the expected loads required by the proposed developments. Please provide all the following information:
 - Location of service(s)
 - Type of development and the amount of fire flow required (as per FUS, 1999).
 - Average daily demand: ___ l/s.
 - Maximum daily demand: ___ l/s.
 - Maximum hourly daily demand: ___ l/s.
- Fire protection (Fire demand, Hydrant Locations)

Sanitary Comments

- The Servicing Brief (Revised) Kanata Town Centre Central Business District Subdivision Memo prepared by J.L.Richards for Urbandale Corporation, dated June 13, 2012 (attached), and the sanitary sewer design sheet prepared by J.L.Richards for Urbandale dated October 12, 2016 (attached) are related to the design of the sanitary sewers along Cordillera/Canadian shield. These documents should be consulted when demonstrating capacity exists for sewage discharging to this location.
- It is anticipated that the proposed development is proposing a greater density of residential units than the approved report. The consultant must demonstrate that the proposed demands can satisfy the existing capacity.
- There are no known sanitary capacity issues downstream and additional capacity modelling will not be required.
- Is a monitoring manhole required on private property? Yes No
- Any premise in which there is commercial or institutional food preparation shall install a grease and oil inceptor on all fixtures.

- If an Environmental Site Assessment (ESA) is required for the proposed development, the ESA may provide recommendations where site contamination may be present. The recommendations from the ESA need to be coordinated with the servicing report to ensure compliance with the Sewer Use By-Law.

Stormwater Management

Quality Control:

- Mississippi Valley Conservation Authority to confirm quality control requirements.

Quantity Control:

- Please refer to the studies provided for allowable run-off coefficient.
- Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min
- Allowable flowrate: Control the 100-year storm events to the 5-year storm event

Ministry of Environment, Conservation and Parks (MECEP)

All development applications should be considered for an Environmental Compliance Approval, under MECP regulations.

- An ECA will be required for the extension of the services to the future parcel within 6905 Campeau Drive through the Transfer of Review program.
- Pre-consultation is not required if applying for standard or additional works (Schedule A of the Agreement) under Transfer Review.
- Pre-consultation with local District office of MECP is recommended for direct submission.
- Consultant completes an MECP request form for a pre-consultation. Sends request to moeccottawasewage@ontario.ca
- ECA applications are required to be submitted online through the MECP portal. A business account required to submit ECA application. For more information visit <https://www.ontario.ca/page/environmental-compliance-approval>

NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent

Other

Capital Works Projects within proximity to application? Yes No

References and Resources

- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
- All required plans are to be submitted on standard A1 size sheets (594mm x 841mm) sheets, utilizing a reasonable and appropriate metric scale as per City of Ottawa Servicing and Grading Plan Requirements: title blocks are to be placed on the right of the sheets and not along the bottom. Engineering plans may be combined, but the Site Plans must be provided separately. Plans shall include the survey monument used to confirm datum. Information shall be provided to enable a non-surveyor to locate the survey monument presented by the consultant.
- All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)
- Please find relevant City of Ottawa Links to Preparing Studies and Plans below:
<https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines>
- To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre:
InformationCentre@ottawa.ca<mailto:InformationCentre@ottawa.ca>
(613) 580-2424 ext. 44455
- geoOttawa
<http://maps.ottawa.ca/geoOttawa/>

SITE PLAN APPLICATION – Municipal servicing

For information on preparing required studies and plans refer to:

<http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans>

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S		1. Site Servicing Plan	2. Site Servicing Brief	S	
S		3. Grade Control and Drainage Plan	4. Geotechnical Study	S	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	S	
S		11. Storm water Management Brief	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise / Vibration Study	S	
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, City Planning will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City’s standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the City.

Notes:

4. Geotechnical Study / Slope Stability Study – required as per Official Plan section 4.8.3. All site plan applications need to demonstrate the soils are suitable for development. A Slope Stability Study may be required with unique circumstances (Schedule K or topography may define slope stability concerns).

10. Erosion and Sediment Control Plan – required with all site plan applications as per Official Plan section 4.7.3.

11. Stormwater Management Report/Brief - required with all site plan applications as per Official Plan section 4.7.6.

Curtis Melanson

From: Erica Ogden <eogden@mvc.on.ca>
Sent: April 9, 2021 10:51 AM
To: Curtis Melanson
Subject: RE: Kanata Avenue Development

Hello Curtis,

Thank you for contacting MVCA. I believe the property you are referring to is currently a part of 6095 Campeau Drive and includes the portions fronting on to Kanata Avenue.

For the site an enhanced level of water quality protection (80% TSS removal is required). The property is not regulated by MVCA under Ontario Regulation 153/06.

It is my understanding there are existing storm service connections on Kanata Ave which would be used for the development, which outlets to the existing stormwater management facility on Maritime Way, constructed as a part of the Urbandale Kanata Town Centre Development. Please refer to the Stormwater Management Report, Kanata Town Centre, Central Business District (J.L. Richards & Associates Limited, Jan 1999). This stormwater facility was designed to provide an Enhanced Level of water quality control.

If you have any questions, please feel free to contact me.

Thank you,

Erica C. Ogden, MCP, RPP | Environmental Planner | Mississippi Valley Conservation Authority
10970 Highway 7, Carleton Place, ON K7C 3P1
www.mvc.on.ca | c. 613 451 0463 | o. 613 253 0006 ext. 229 | eogden@mvc.on.ca

From: Curtis Melanson <c.melanson@mcintoshperry.com>
Sent: March 30, 2021 10:59 AM
To: Erica Ogden <eogden@mvc.on.ca>
Subject: Kanata Avenue Development

Hi Erica,

We're working on a project in the Kanata Centrum. It's located on the north side of Kanata Avenue and the project consists of a new 6 storey apartment building with commercial/retail on the ground floor. There will be approximately 200 units complete with 2 levels of underground parking. The footprint of the building is 4,720m² and will have limited at grade parking. The site will largely consist of landscaped areas. See attached site plan for reference.

We have pre-consulted with the City and received the stormwater management quantity control, but we're checking with MVCA for quality control. Can you let me know what, if any, quality control is required for the site?

If you have any questions/concerns please don't hesitate to call or email.

Thanks,

Curtis Melanson, C.E.T.

Practice Area Lead, Land Development
115 Walgreen Road, R.R. 3, Carp, ON K0A 1L0

APPENDIX C
WATERMAIN CALCULATIONS

APPENDIX D
SANITARY SEWER CALCULATIONS

Project: CCO-21-3764 – 180 Kanata Ave – The Woods
Designed By: RRR
Checked By: NBV
Date: June 30, 2021

Re: Sanitary Flow Calculations

1. Building Occupancy

The maximum number of bedroom units will be 304 units as per the architect with zero washing machines. The ground level of the building will serve as general commercial space.

2. Daily Volume in Litres

As per the extract of the City of Ottawa Sewer Design Guidelines, Appendix 4-A; Daily Sewage Flow for Dwellings;

- Each dwelling unit of 1 bedroom
= 275 Liters/ Dwelling/ Day

As per the extract of the City of Ottawa Sewer Design Guidelines, Appendix 4-A; Daily Sewage Flow for commercial;

- Commercial sewage flow per unit area
= 28,000 Liters/ Gross ha/ Day

3. Peak Flow (Q/p)

- $Q_{1-BED}(p) = F_{1-BED} \times P_{1-BED}$ Where:
 $F_{1-BED} = 275$ Liters/ Dwelling/ Day (as per City of Ottawa Sewer Design Guidelines)
 $P_{1-BED} = 304$ Units (as per architect)
- Therefore, $Q_{1-BED}(p) = (275) \times (304) = \underline{83,600 \text{ L/ Day (0.967 L/sec)}}$
- $Q_{COM}(p) = F_{COM} \times A_{COM}$ Where:
 $F_{COM} = 28,000$ Liters/ Gross ha/ Day (as per City of Ottawa Sewer Design Guidelines)
 $A_{COM} =$ Gross commercial area in hectares
- Therefore, $Q_{COM}(p) = (28,000) \times (1.11) = \underline{31,080 \text{ L/ Day (0.359 L/sec)}}$

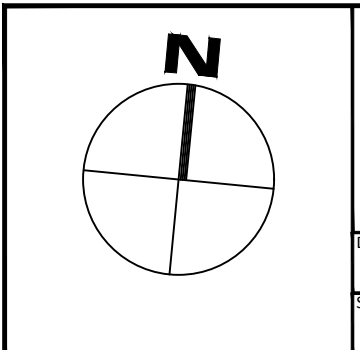
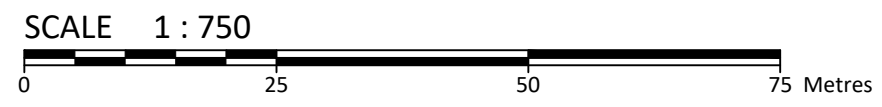
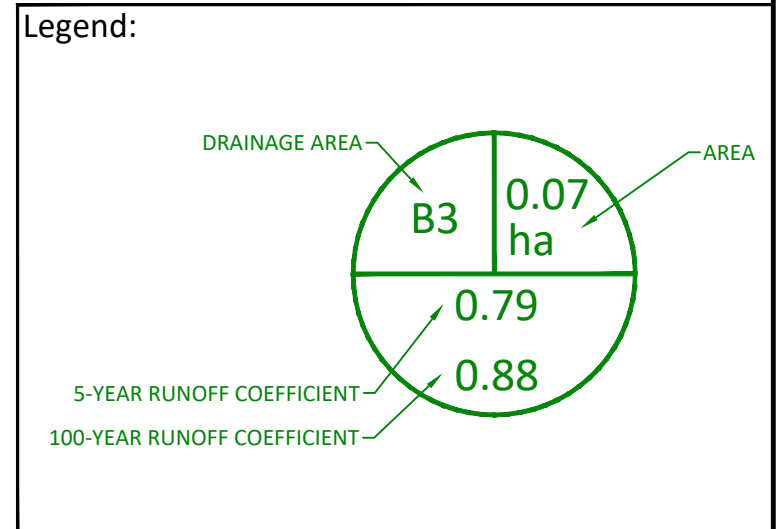
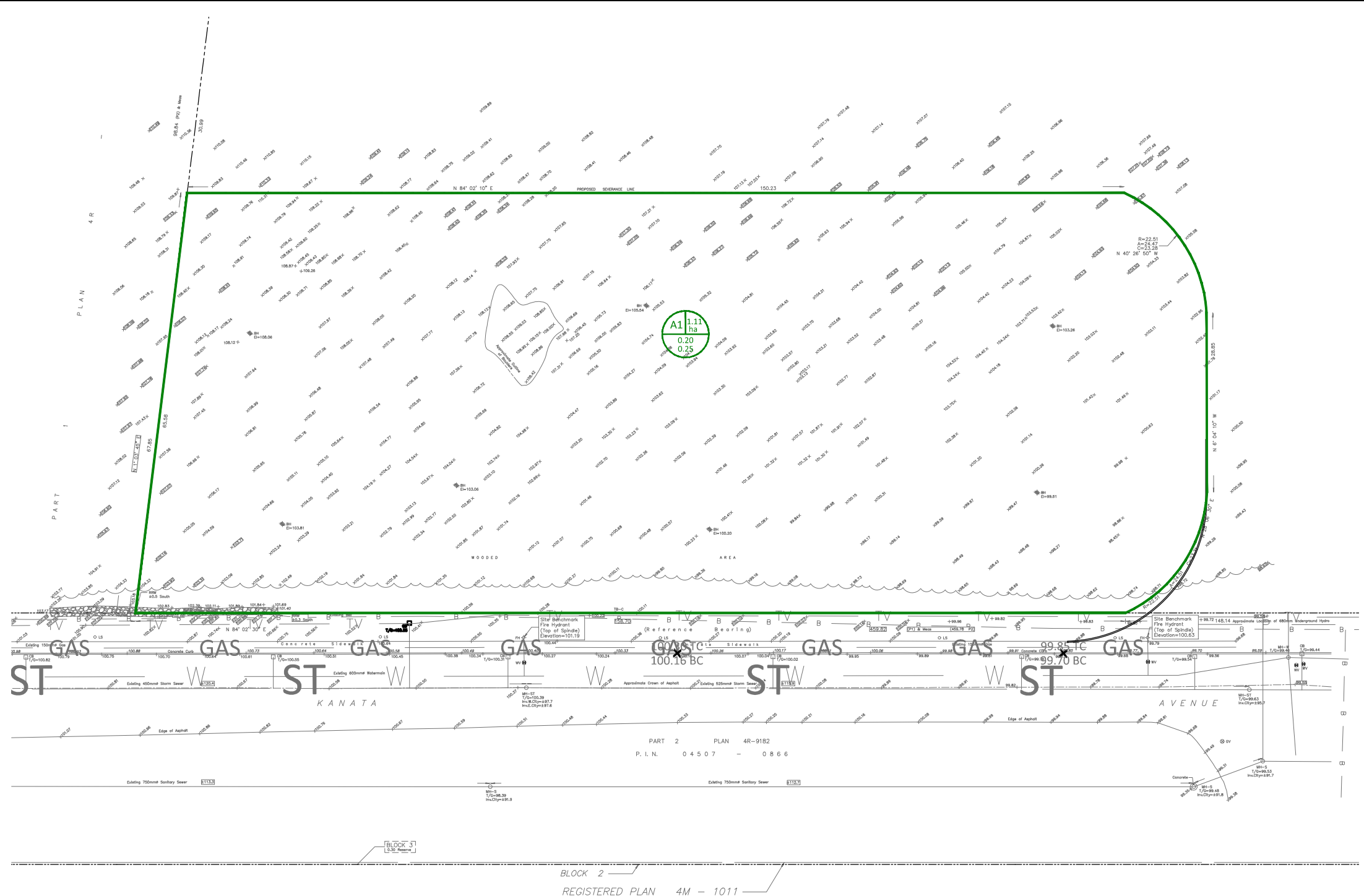
- Therefore,
- $Q_{TOTAL}(p) = Q_{1-BED} + Q_{COM}$ Where:
 $Q_{1-BED} = 83,600 \text{ L/ Day}$
 $Q_{COM} = 31,080 \text{ L/ Day}$

- Therefore, $Q_{\text{TOTAL}(p)} = (83,600) + (31,080) = \underline{114,680 \text{ L/ Day (1.33 L/ sec)}}$

The capacity of a 200mm sewer with a slope of 2.00% is 48.39L/s. Therefore, the proposed 200mm diameter PVC sanitary main located at the site's east entrance has the will accommodate the building's sanitary flow at a capacity of 2.75%.

APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

FILENAME: U:\Ottawa\01 Project - Proposals\2021 Jobs\CCO\21-3764 Theberge - The Woods_6905 Campau Drive\12 - Drawings\CCO-21-3764_Presentation.dwg
 LAST SAVED: Wednesday, June 30, 2021 LAST SAVED BY: rrobinson
 LAST PLOTTED: Wednesday, June 30, 2021 CTE FILE USED: ---

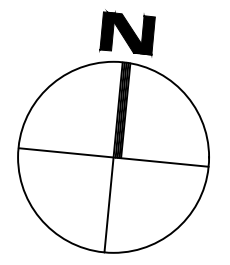
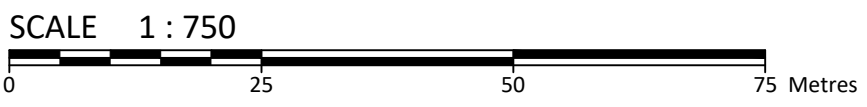
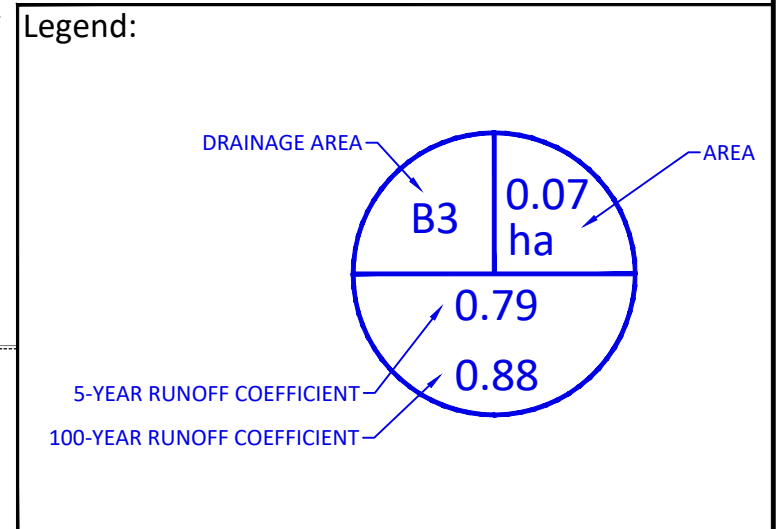
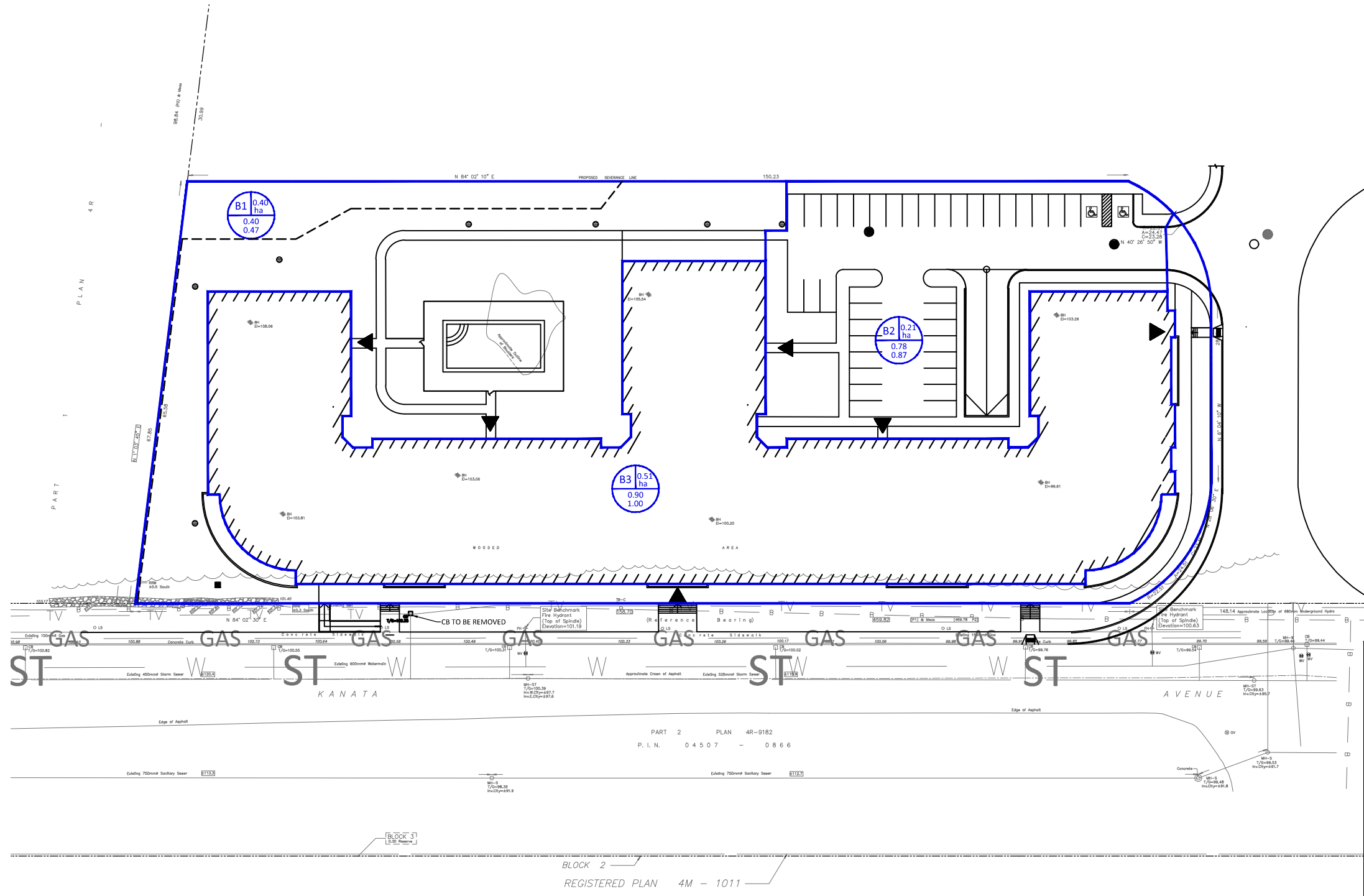


McINTOSH PERRY
 115 Walgreen Road, RR3, Carp, ON K0A 1L0
 Tel: 613-836-2184 Fax: 613-836-3742
 www.mcintoshperry.com

Client:		THEBERGE 205-1600 LAPERRIERE AVE, ON K1Z 8P5	
Project:		THE WOODS 180 KANATA AVE	
Drawing Title:		PRE-DEVELOPMENT DRAINAGE AREA PLAN	
Drawn by:	Checked By:	Drawing Number:	
R.R.R.	C.J.M.	PRE	
Scale:	Project Number:	1 ISSUED FOR REVIEW	JUNE 30, 2021
1:750	CCO-21-3764	No. Revisions	Date

APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

FILENAME: U:\Ottawa\01 Project - Proposals\2021 Jobs\CCO\CCO-21-3764\Drawings\CCO-21-3764_Presentation.dwg
 LAST SAVED: Wednesday, June 30, 2021 10:58:56 AM LAST SAVED BY: rrobbins
 LAST PLOTTED: Wednesday, June 30, 2021 11:01:00 AM



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 www.mcintoshperry.com

Drawn by:	Checked By:
R.R.R.	C.J.M.
Scale:	Project Number:
1:750	CCO-21-3764

Client:	THEBERGE 205-1600 LAPERRIERE AVE, ON K1Z 8P5	
Project:	THE WOODS 180 KANATA AVE	
Drawing Title:	POST-DEVELOPMENT DRAINAGE AREA PLAN	
Drawing Number:	POST	
No.	Revisions	Date
1	ISSUED FOR REVIEW	JUNE 30, 2021

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

CCO-21-3764 - 180 Kanata Avenue - Runoff Calculations

1 of 4

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	1.11	0.00	0.90	0.00	0.60	11,136.00	0.20	0.20	0.25

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	1.11	0.20	0.25	10	76.8	104.2	178.6	47.55	64.51	138.20
Total	1.11							47.55	64.51	138.20

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	0.396	1,159.30	0.90	0.00	0.60	2,799.70	0.20	0.40	0.47	Unrestricted
B2	0.210	1,743.56	0.90	0.00	0.60	358.44	0.20	0.78	0.87	Unrestricted
B3	0.508	5,075.00	0.90	0.00	0.60	0.00	0.20	0.90	1.00	Restricted Roof

Post-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
B1	0.396	0.40	0.47	10	76.8	104.2	178.6	34.23	46.44	92.29
B2	0.210	0.78	0.87	10	76.8	104.2	178.6	35.04	47.53	91.00
B3	0.508	0.90	1.00	10	76.8	104.2	178.6	97.52	132.30	251.92
Total	1.11							166.79	226.27	435.21

Required Restricted Flow

Drainage Area	Area (ha)	C (5-Year)	Tc (min)	I (mm/hr)	Q (L/s)
				5-Year	5-Year
A1	1.11	0.80	10	104.2	258.05
Total	1.11				258.05

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/s)			Restricted Flow (L/s)			Storage Required (m ³)		Storage Provided (m ³)	
	2-Year	5-Year	100-Year	2-Year	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year
B1	34.23	46.44	92.29	34.23	46.44	92.29	-	-	-	-
B2	35.04	47.53	91.00	35.04	47.53	91.00	-	-	-	-
B3	97.52	132.30	251.92	3.24	4.32	8.10	148.14	277.70	152.25	285.47
Total	166.79	226.27	435.21	72.51	98.29	191.39	148.14	277.70	152.25	285.47

McINTOSH PERRY

CP-18-0534 - 1305 Maritime Way - Runoff Calculations

Storage Requirements for Area B3

2-Year Storm Event

Tc	I	B3 Runoff	Allowable	Runoff to	Storage
(min)	(min)	(L/s)	Outflow	be Stored	Required
			(L/s)	(L/s)	(m ³)
130	13.7	17.38	3.24	14.14	110.31
135	13.3	16.88	3.24	13.64	110.50
140	12.9	16.41	3.24	13.17	110.65
145	12.6	15.97	3.24	12.73	110.77
150	12.3	15.56	3.24	12.32	110.85
155	11.9	15.16	3.24	11.92	110.90
160	11.7	14.79	3.24	11.55	110.92

Maximum Storage Required 2-Year (m³) = 110.92

5-Year Storm Event

Tc	I	B3 Runoff	Allowable	Runoff to	Storage
(min)	(min)	(L/s)	Outflow	be Stored	Required
			(L/s)	(L/s)	(m ³)
140	17.3	21.93	4.32	17.61	147.90
145	16.8	21.33	4.32	17.01	148.02
150	16.4	20.78	4.32	16.46	148.10
155	15.9	20.25	4.32	15.93	148.14
160	15.6	19.75	4.32	15.43	148.14
165	15.2	19.28	4.32	14.96	148.11
170	14.8	18.83	4.32	14.51	148.04

Maximum Storage Required 5-Year (m³) = 148.14

100-Year Storm Event

Tc	I	B3 Runoff	Allowable	Runoff to	Storage
(min)	(min)	(L/s)	Outflow	be Stored	Required
			(L/s)	(L/s)	(m ³)
150	27.6	38.95	8.10	30.85	277.69
155	26.9	37.96	8.10	29.86	277.70
160	26.2	37.02	8.10	28.92	277.63
165	25.6	36.13	8.10	28.03	277.50
170	25.0	35.29	8.10	27.19	277.30
175	24.4	34.48	8.10	26.38	277.04
180	23.9	33.72	8.10	25.62	276.73

Maximum Storage Required 100-Year (m³) = 277.70

Storage Occupied In Area

2-Year Storm Event

Roof Storage			
Location	Area (m ²)	Depth (m)	Volume (m ³)
ROOFTOP	3806.3	0.030	114.2

Storage Available (m³) = 114.2

Storage Required (m³) = 110.9

5-Year Storm Event

Roof Storage			
Location	Area (m ²)	Depth (m)	Volume (m ³)
ROOFTOP	3806.3	0.040	152.3

Storage Available (m³) = 152.3

Storage Required (m³) = 148.1

100-YEAR STORM EVENT

Roof Storage			
Location	Area (m ²)	Depth (m)	Volume (m ³)
ROOFTOP	3806.3	0.075	285.5

Storage Available (m³) = 285.5

Storage Required (m³) = 277.7

*Area is calculated using 75% of the total roof area

McINTOSH PERRY

CP-18-0056 - 119-121 BEECHWOOD AVENUE - ROOF DRAIN DISCHARGE

Roof Drain Flow (B5)

Roof Drains Summary			
Type of Control Device	Watts Drainage - Accutrol Weir		
Number of Roof Drains	9		
	2-Year	5-Year	100 Year
Rooftop Storage	114.19	152.25	285.47
Storage Depth (m)	0.030	0.040	0.075
Flow (Per Roof Drain) (L/s)	0.36	0.48	0.90
Total Flow (L/s)	3.24	4.32	8.10

Roof Drain Flow For Flat Roof B2

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.18
20	0.24
25	0.30
30	0.36
35	0.42
40	0.48
45	0.54
50	0.60
55	0.66

*Roof Drain model to be Accutrol Weirs, See attached sheets

*Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

1 roof drain during a 5 year storm

elevation of water = 25mm

Flow leaving 1 roof drain = (1 x 0.30 L/s) = 0.30 L/s

1 roof drain during a 100 year storm

elevation of water = 50mm

Flow leaving 1 roof drain = (1 x 0.60 L/s) = 0.60 L/s

4 roof drains during a 5 year storm

elevation of water = 25mm

Flow leaving 4 roof drains = (4 x 0.30 L/s) = 1.20 L/s

4 roof drains during a 100 year storm

elevation of water = 50mm

Flow leaving 4 roof drains = (4 x 0.60 L/s) = 2.40 L/s

Roof Drain Flow			
	Flow (L/s)	Storage Depth (mm)	Total Flow (L/s)
	0.18	15	0.72
	0.24	20	0.96
	0.30	25	1.20
2-Yr	0.36	30	1.44
	0.42	35	1.68
5-Yr	0.48	40	1.92
	0.54	45	2.16
	0.60	50	2.40
	0.66	55	2.64
	0.72	60	2.88
	0.78	65	3.12
	0.84	70	3.36
100-Yr	0.90	75	3.60
	0.96	80	3.84
	1.02	85	4.08
	1.08	90	4.32
	1.14	95	4.56
	1.20	100	4.80
	1.26	105	5.04
	1.32	110	5.28
	1.38	115	5.52
	1.44	120	5.76
	1.50	125	6.00
	1.56	130	6.24
	1.62	135	6.48
	1.68	140	6.72
	1.74	145	6.96
	1.80	150	7.20

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

McINTOSH PERRY

CCO-21-3764 - 180 Kanata Avenue - Runoff Calculations

4 of 4

Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	146	8.00	6	5

Therefore, a Tc of 10 can be used

$$T_c = (3.26(1.1-c)L^{0.5}/S^{0.33})$$

c= Blanced Runoff Coefficient

L= Length of drainage area

S= Average slope of watershed

STORM SEWER DESIGN SHEET

PROJECT: Mixed Used Development
LOCATION: 180 Kanata Avenue
CLIENT:

LOCATION				CONTRIBUTING AREA (ha)				RATIONAL DESIGN FLOW										SEWER DATA											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			25	26	27	28		
STREET	AREA ID	FROM MH	TO MH	C-VALUE	AREA (ha)	INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)			
																					DIA	W	H			(L/s)	(%)		
	B3	Roof Drain	Tee	0.90	0.51	0.51		10.00						132.30		251.92	7.02	7.02	34.22	11.96	200			1.00	1.055	27.20	79.48%		
	B2	CBMH1	CBMH2	0.78	0.21	0.16	0.16	10.00	0.67	10.67	104.19			47.53				47.53	71.33	39.19	300			0.50	0.978	23.80	33.37%		
		CBMH2	MH3			0.00	0.16	10.67	0.38	11.05	100.79			45.98				45.98	71.33	22.34	300			0.50	0.978	25.36	35.55%		
	B1	LCB4	LCB5	0.40	0.40	0.16	0.16	10.00	0.20	10.20	104.19			46.44				46.44	71.33	11.94	300			0.50	0.978	24.89	34.90%		
		LCB5	LCB6			0.00	0.16	10.20	0.30	10.51	103.13			45.97				45.97	71.33	17.81	300			0.50	0.978	25.37	35.56%		
		LCB6	LCB7			0.00	0.16	10.51	0.35	10.85	101.59			45.28				45.28	71.33	20.24	300			0.50	0.978	26.05	36.52%		
		LCB7	LCB8			0.00	0.16	10.85	0.52	11.38	99.90			44.53				44.53	71.33	30.76	300			0.50	0.978	26.81	37.58%		
		LCB8	LCB9			0.00	0.16	11.38	0.24	11.62	97.44			43.43				43.43	71.33	14.09	300			0.50	0.978	27.90	39.11%		
		LCB9	LCB10			0.00	0.16	11.62	0.64	12.26	96.36			42.95				42.95	71.33	37.78	300			0.50	0.978	28.38	39.79%		
		LCB10	DICB11			0.00	0.16	12.26	0.18	12.44	93.60			41.72				41.72	71.33	10.45	300			0.50	0.978	29.62	41.52%		
Definitions: Q = 2.78CIA, where: Q = Peak Flow in Litres per Second (L/s) A = Area in Hectares (ha) i = Rainfall intensity in millimeters per hour (mm/hr) [i = 998.071 / (TC+6.053)^0.814] 5 YEAR [i = 1174.184 / (TC+6.014)^0.816] 10 YEAR [i = 1735.688 / (TC+6.014)^0.820] 100 YEAR				Notes: 1. Mannings coefficient (n) = 0.013				Designed: N.B.V.				Checked: C.J.M.				Project No.: CCO-21-3764				No. 1.		Revision ISSUED FOR REVIEW				Date 2021-06-30		Sheet No: 1 of 1	

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 E
<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 A
<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).	Site Grading, Drainage, Sediment & Erosion Control Plan (C101)
<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.	Site Grading, Drainage, Sediment & Erosion Control Plan (C101)
<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
<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 	Site Grading, Drainage, Sediment & Erosion Control Plan (C101)

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	N/A
<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 B
<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	N/A

<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 B
<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 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)	N/A
<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 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 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 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 Management
<input type="checkbox"/> Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 6.0 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 F

<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, Drainage, Sediment & Erosion Control 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 6.0 Stormwater Management Appendix F
<input type="checkbox"/> Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 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 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.	Appendix 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 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.	Site Grading, Drainage, Sediment & Erosion Control Plan (C101)
<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 7.0 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 8.0 Summary Section 9.0 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