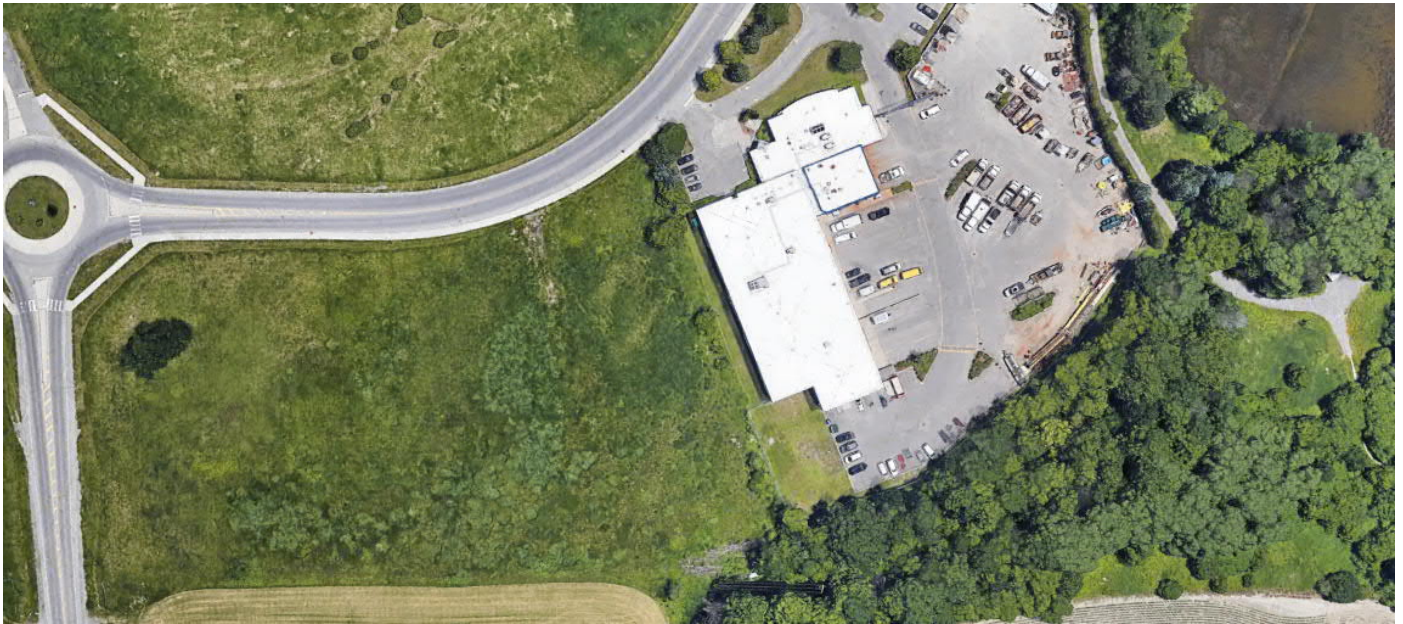


SERVICING AND STORMWATER MANAGEMENT REPORT

2 BILL LEATHEM DRIVE – WAREHOUSE & OFFICE ADDITION



MP Project No.: CP-20-0023-01

City File No.:

Prepared for:

BBS Construction (Ontario) Ltd.

1805 Woodward Drive

Ottawa, ON

K2C 0P9

Prepared by:

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April 04, 2022

Revised May 24, 2022

McINTOSH PERRY

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by BBS to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the proposed Office & Warehouse Addition located at 2 Bill Leatham Drive 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 Rideau Valley Conservation Authority (RVCA), 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:

- CP-20-0023-01, C100 – Removals, Erosion & Sediment Control Plan,
- CP-20-0023-01, C101 – Site Grading and Drainage Plan, and
- CP-20-0023-01, C102 – Site Servicing Plan.

1.2 Site Description

The property is located at 2 Bill Leatham Drive, within the City of Ottawa. It is described as Part of Lot 18, Concession 1 (Rideau Front), Geographic Township of Nepean, City of Ottawa. The developable land in question covers approximately 1.21 ha and is located on the southwest side of Bill Leatham Drive at the very east end of Longfields Drive.

The existing site is developed with an office/warehouse building. There is a triangular piece of the property at the southeast extents of the development area which is heavily treed and fronts onto the Longfield/Davidson Stormwater Management Facility (LDSWMF). This entire area will remain as in existing conditions and will not be disturbed for the proposed development.

Adjacent to the property at the north end of the site is an undeveloped parcel of land, where as the property to the southeast is entirely developed with a Canada Post Depot.

The proposed development consists of one-storey 1379 m² addition to the existing building that will be primarily warehouse with some office space. Additional parking will be added adjacent to the existing drive aisles to accommodate the proposed development. Landscaping will be located at the front of the building and along the property lines. There are two site accesses for the development that will be maintained. 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, a topographical survey of the previously existing site, an as-built 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.

A topographic survey of the site was completed by Farley, Smith & Denis Surveying Ltd. dated March 3, 2020 and can be found under separate cover.

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

- Geotechnical Investigation completed by Paterson Group dated March 26, 2020.
- Phase I ESA completed by McIntosh Perry Consulting Engineers Ltd. dated April 3, 2020.
- Site Grading, Drainage, and Servicing reports for the existing site completed by McIntosh Perry Consulting Engineers Ltd. dated August 13, 2020.

3.0 PRE-CONSULTATION SUMMARY

City of Ottawa Staff have been pre-consulted regarding this proposed development via Microsoft Teams on March 4th, 2022. Specific design parameters to be incorporated within this design include the following:

- Quantity control to be as per the City of Nepean South Merivale Business Park Stormwater Management Study;
- Allowable runoff coefficient 'C' of 0.65;
- Time of Concentration (Tc) maximum of 15 min;
- 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;
- The SWM is only required to address the area of development. The existing triangular piece of the property that is heavily treed can be excluded;
- The LDSWMF provides water quality protection for the site, therefore no lot level protections are required, and
- Best management practices are to be employed on site.

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

4.0 EXISTING SERVICES

There is an existing 250 mm diameter sanitary sewer as well as a storm sewer that varies in size located within Bill Leathem Drive. The storm sewer is 675mm along the north of the property but increases in size to a 750 mm diameter pipe with the manhole to the east. There is also a 305 mm diameter watermain within Bill Leathem Drive and fire hydrants located along the north west side of Bill Leathem Drive. There are existing 450 mm diameter storm, 150mm diameter sanitary, and 100mm diameter water services within the site, connected to the previously mentioned mains within Bill Leathem Drive. An existing storm manhole and sanitary manhole are located within the subject site.

5.0 SERVICING PLAN

5.1 Proposed Servicing Overview

The overall servicing will be provided via the existing connections to the mains within Bill Leathem Drive. The proposed building will tie into the existing 100 mm water services extending from the 305 mm diameter watermain, and the existing 150 mm diameter sanitary service extending from the 250 mm diameter sanitary main. The existing storm service will be adjust to tie directly into the existing manhole on site and to service the proposed addition. 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

The proposed building will utilize the existing 100 mm PVC diameter water service connected to the existing 305 mm PVC watermain within Bill Leathem Drive, complete with an existing water valve located at the property line. The existing fire hydrants within Bill Leathem Drive will be used to service the site. Site grading will be designed such that the existing service will have a minimum 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 1.0 (ordinary type construction). The total floor area ('A' value) for the FUS calculation was determined to be 3,216 m². The results of the calculations yielded a required fire flow of 13,000 L/min. A fire flow of 6,300 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

Site Area	1.21 ha
Industrial - Light	35,000 L/ha/day
Average Day Demand (L/s)	0.49
Maximum Daily Demand (L/s)	0.74
Peak Hourly Demand (L/s)	1.32
OBC Fire Flow Requirement (L/s)	105.00
FUS Fire Flow Requirement (L/s)	216.67
Max Day + Fire Flow (FUS) (L/s)	217.41

Boundary conditions have been provided by the City of Ottawa for the current conditions and are available in Appendix 'C'. A water model was completed using Bentley's WaterCAD based on the boundary conditions. The results determined that the proposed 100mm watermain can adequately service the proposed development and provide sufficient fire flow since Hydrant H-1 produced available fire flows of 14,707 L/min. Refer to drawing for more details. The results are available in Appendix 'C' of this report.

The normal operating pressure range is anticipated to be 51.34 psi (354 kPa) to 62.41 psi (430kPa) and will not be less than 40 psi (275 kPa) or exceed 100 psi (689 kPa). The proposed watermain will meet the minimum required 20 psi (140 kPa) at the ground level under maximum day demand and fire flow conditions.

Table 2: Water Pressure at Junctions per Scenario

Junction	Average Day (psi)	Peak Hourly (psi)	Max. Day + Fire Flow (psi)
J-1 (BLDG)	62.41	51.34	35.91

To confirm the adequacy of fire flow to protect the proposed development, public and private fire hydrants within 100 m of the proposed building were analysed per City of Ottawa ISTB 2018-02 Appendix I Table 1. The results are demonstrated below.

Table 3: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m	Fire Hydrant(s) within 150m	Combined Fire Flow (L/min.)
Site Address	13,000	2	2	19,000

5.3 Proposed Sanitary Design

The existing 150 mm diameter gravity sanitary service connected to the existing 250 mm diameter sewer within Bill Leathem Drive will be used to service the addition. The existing sanitary service is complete with an existing 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 existing 150mm diameter gravity sanitary service has 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 an office/warehouse facility. The total area of the building, including the proposed addition, is 3,216 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 0.49 L/s, therefore the existing 150 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 existing lateral or within the existing sanitary main within Bill Leathem Drive as the amount of flow leaving the site is minimal.

5.4 Proposed Storm Design

Stormwater runoff will be conveyed by way of overland sheet flow to the existing storm sewer network. Runoff will be concentrated within the asphalt areas where it will flow towards the proposed catchbasins to then be conveyed through the on-site stormwater management system to the existing 750 mm storm sewer within Bill Leathem Drive. 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 existing on-site storage and inlet control device (ICD). 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 Bill Leathem Drive. 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 buildings 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 catchbasins (CB's) and catchbasin manholes (CBMH's) located throughout the site. The restricted stormwater runoff will be directed to the existing sewer within Bill Leathem Drive; similarly, overland flow will be directed towards Bill Leathem Drive through the existing low point at the SWM area. 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 RVCA and the City:

Quality Control

- No quality control is required. Quality control will be provided in the existing LDSWMF downstream.

Quantity Control

- Post-development flow (5 & 100 year) is to be restricted to match the 5-year pre-development flow with a C value of 0.65 and time of concentration (Tc) of 15 minutes.

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 Ottawa 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.

As per the pre-consultation meeting with the City of Ottawa the time of concentration (T_c) used for pre-development shall be calculated using a time of concentration (T_c) of 15 minutes and post-development flows shall be calculated using a time of concentration (T_c) 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 CP-20-0023-01 – PRE in Appendix 'E' of this report for more details. Drainage area A1 represents the flow that goes to the Bill Leatham Drive right of way. A summary of the pre-development runoff calculations can be found below.

Table 4: 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	1.21	0.20	0.25	20	47.19	100.71
Total	1.21				47.19	100.71

See CP-20-0023-01 – 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 CP-20-0023-01 – POST in Appendix 'F' of this report for more details. A summary of the Post-Development Runoff Calculations can be found below.

Table 5: 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	0.36	0.82	0.92	10	85.10	162.61
B2	0.35	0.88	0.98	10	89.03	169.66
B3	0.12	0.20	0.25	10	6.83	14.64
B4	0.10	0.89	0.99	10	40.87	79.25
B5	0.10	0.89	0.99	10	8.65	18.54
Total	1.21				230.49	444.69

See CP-20-0023-01 – POST in Appendix 'F' and Appendix 'G' for calculations

Runoff will be captured and conveyed to an existing storm sewer network which connects to the existing 750 mm storm sewer within Bill Leatham Drive. In order to match pre-development flows, on site storage will be

required. Storage will be provided within a grass swale located at along the south east property line. All other runoff with exception to drainage areas B4 and B5 will be captured and directed to the proposed storm network. An Inlet control device within existing MH7 will then restrict all the captured runoff to the 5-year pre-development flow. See Appendix 'G' for calculations.

6.3 Quantity Control

After discussing the stormwater management criteria for the site with City staff, the total post-development runoff for this site has been restricted to match the 5-year pre-development flow rates with a C value of 0.65. (See Appendix 'B' for pre-consultation notes). These values create the following allowable release rates and storage volumes for the development site.

Table 6: Allowable Release Rate

Area ID	Drainage Area (ha)	Runoff Coefficient	T _c (min)	Required Restricted Flow 5-year (L/s)
A1	1.21	0.65	15	182.40
Total	1.21			182.40

See Appendix 'G' for calculations

Reducing site flows will be achieved using flow restrictions and will create the need for onsite storage. Runoff from areas B1-B3 will be restricted as detailed in the table below.

Table 7: 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)
B1	0.36	0.82	0.92	10	76.32	80.51
B2	0.35	0.88	0.98	10		
B3	0.12	0.20	0.25	10		
B4	0.24	0.59	0.67	10	40.87	79.25
B5	0.15	0.20	0.25	10	8.65	18.54
Total	1.21				125.84	178.30

See Appendix 'G' for calculations

Runoff from Area B1 through B3 will be restricted at existing MH7 through an existing 160mm Orifice (Design Head of 2.27). This orifice plug will restrict areas B1 through B3 to 76.32 L/s for the 5-year and 80.51 L/s for the 100-year storm event. The restriction creates a required storage volume of 62.79 m³ and a corresponding water surface elevation (WSEL) of 89.74 m for the 5-year storm event. Likewise, the restriction creates required storage volume of 183.03 m³ and a WSEL of 89.97 m for the 100-year storm event. The storage for this area will

be provided in the grass swale within drainage area B3. Table 6 details the required and provided storage volumes for the site. Runoff from area B5 will be unrestricted and follow existing drainage patterns.

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 buildings and off of the site towards Bill Leatham Drive. The loading area at the back (B1 and B2) will convey flows to the grass swale (B3) where it will overtop the highpoint and discharge to Bill Leatham Drive. Area B4 will discharge to Bill Leatham Drive. The following table summarizes the storage requirements during the 5 and 100-year storm events and the provided storage volumes.

Table 8: Storage Summary

Drainage Area	Depth of Ponding (m)	Storage Required (m³)	Storage Available (m³)	Depth of Ponding (m)	Storage Required (m³)	Storage Available (m³)
	5-Year			100-Year		
B1-B3	0.24	62.79	63.01	0.47	183.03	183.30

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 RVCA, the existing storm main within Bill Leatham Drive ties into the LDSWMF which provides appropriate quality control for the site. This facility has been designed to accommodate runoff from Bill Leatham Drive within the tributary drainage area. Therefore, no additional on-site quality treatment has been provided. The combination of the above BMP's and the proposed flow control measures will aid in the thermal protection of the natural environment.

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 ditches 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, RVCA 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 RVCA 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

Rip-rap will be placed at all locations that have the potential for concentrated flow. It is crucial that the Contractor ensure that the geotextile is keyed in properly to ensure runoff does not undermine the rip rapped area. Additional rip rap is to be placed at erosion prone locations as identified by the Contractor / Contract Administrator / City of Ottawa or RVCA.

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 1,379 m² warehouse addition will be constructed on the site located at 2 Bill Leathem Drive.
- The existing 150 mm diameter sanitary service and monitoring manhole, connected to the 250 mm diameter sanitary main within Bill Leathem Drive, will be utilized to service the proposed addition.
- The existing 100mm diameter water lateral will be utilized to service the proposed development. Fire protection will be provided by the existing hydrants along Bill Leathem Drive.
- The existing on-site storm network will convey flows to the retention area where a proposed storm sewer and new ICD will provide the necessary flow restriction before outletting.
- 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 0.65.
- Storage for the 5- through 100-year storm events will be provided within a grass storage swale located along the southeast property line.
- The LDSWMF located downstream has been previously constructed to provide appropriate quality control for the site as per the RVCA.

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 warehouse/office addition at 2 Bill Leatham Drive.

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.



A handwritten signature in blue ink, appearing to read "N. Vachon".

Nicholas Vachon, EIT
Engineering Intern, Land Development
McIntosh Perry Consulting Engineers
T: 613.875.1334
E: n.vachon@mcintoshperry.com

A handwritten signature in black ink, appearing to read "Brent Cuming".

Brent Cuming, P.Eng.
Project Engineer, Land Development
McIntosh Perry Consulting Engineers
T: 613.836.2184
E: b.cuming@mcintoshperry.com

10.0 STATEMENT OF LIMITATIONS

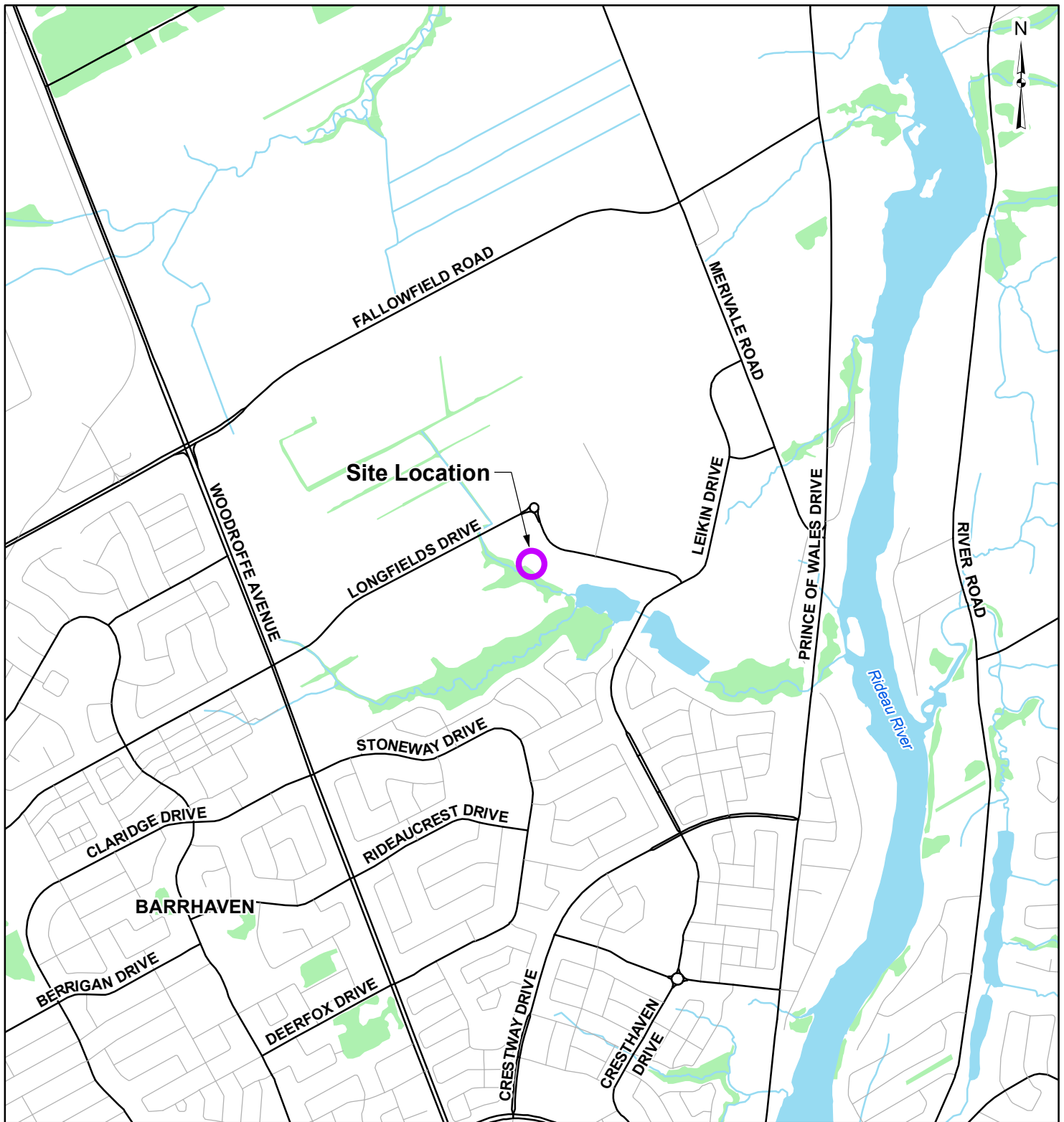
This report was produced for the exclusive use of BBS Construction Ltd.. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry 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

U:\Ottawa\01 Project - Proposals\2020 Jobs\CP-Projects\0CP-20-0023 BBS - SPC Warehouse - 2 Bill Leatham Drive\GIS\mxd\CP-20-0023_01_SiteLocation_Proposed Warehouse.mxd



LEGEND

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

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2020.

500 250 0 500
Scale 1:20,000 Metres

CLIENT:		BBS CONSTRUCTION LTD.	
PROJECT:		PROPOSED WAREHOUSE/OFFICE 2 BILL LEATHAM DRIVE	
TITLE:		SITE LOCATION	
McINTOSH PERRY 115 Walgreen Road, RR3, Carp, ON K0A1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com		PROJECT NO: CP-20-0023-01	FIGURE:
		Date	Jun., 11, 2020
		GIS	EU
		Checked By	NV
		1	

APPENDIX B
CITY OF OTTAWA PRE-CONSULTATION NOTES

Pre-Application Consultation Meeting Notes

Property Address: 2 Bill Leathem Drive
Pre-Application Consultation File Number: PC2022-0017
2022-02-04, MS TEAMS

Attendees:

Owner: 1850591 Ontario Ltd. c/o Pat Hunter

Applicant: Bridgette Alchawa (McIntosh Perry); Fits Bosman (BBS Construction); Abhishek Sharma (BBS Construction); Curtis Melanson (McIntosh Perry)

City of Ottawa & External Staff: Aamani Sidhu (Dev South), Adrian Van Wyk (Urban Design); Kelsey Charie (Infrastructure Approvals Intern PM), Eric Lalonde (RVCA), Jeanette Krabicka (Parks), Sharif Golam (Infrastructure Approvals PM); Katie O'Callaghan (Dev South)

Regrets: Mike Giampa (Transportation); Mark Richardson (Forestry); Sami Rehman (Natural Features)

Subject: Site Plan Control Application located at 2 Bill Leathem Drive

Meeting notes:

Opening & attendee introduction

- Introduction of meeting attendees
- Overview of proposal (application led): Site Plan Control (Standard)
- 14,617 square foot (1,358 square metre), addition to the existing building. The addition will be constructed at the front (northeast) side of the existing building. The existing parking will be located to the sides and rear of the existing building. New landscaping beds will be located at the front of the proposed addition.

High-Level Planning Overview:

1. Existing Official Plan – designated “General Employment Area” on Schedule B of the City of Ottawa’s Official Plan
2. In the New OP, the subject property is identified as, “Suburban” on Schedule A – Transect Policy Area. On Schedule B6 – Suburban (Southwest) Transect identifies the site as “Mixed Industrial”. The following uses are permitted in the Mixed Industrial designation, as shown on Schedules B1 through B8:
 - a) **Low-impact light industrial uses including light manufacturing, warehousing, distribution and storage;**
 - b) Automotive sales and service, heavy equipment sales and service;
 - c) Trades and contractors such as carpenters, plumbers, electricians and heating, ventilation, and air conditioning.
 - d) Major Office in accordance with Subsection 3.5 Policy 12
 - e) **Small-scale office that is typically less than 10,000 square metres**
3. The subject property is within the South Merivale Business Park and is Zoned IL9 – Light Industrial Zone. A wide range of low impact light industrial uses, as well as office type uses are permitted. In Subzone 9, a warehouse use is allowed only where it is associated with or accessory to a permitted use. **As a stand-alone warehouse is not permitted for this zone, it must be associated with one of the following uses: office.**

3. Erosion and Sediment Control Plan
 4. Storm Drainage / Ponding Plan
 5. Stormwater Management and Site Servicing Report
 6. Geotechnical Investigation Report
- Additional Notes:
 - An ECA was discussed in the meeting for this application, and it was stated that this application was exempt from an ECA, please provide the correspondence emails from the MECP verifying this please.
 - With the increase in building footprint area, please note that another water boundary conditions request must be made.
 - Please also note that if water demand increases to more than 50 m³/d, a watermain redundancy will be required.
 - Please also ensure that the South Merivale Business Park Stormwater Management Study is referenced for all stormwater management criteria.

Urban Design (Adrian van Wyk)

- An Urban Design Brief will be required. Please see the Terms of Reference attached.
- The building should have a street-fronting main entrance accessible from Bill Leathem Drive.
- Bicycle parking should be located next to an entrance ideally.
- The applicant is encouraged to design the addition with a curved façade to follow the counter of Bill Leathem Drive.
- Please consider tree retention (especially of the newly planted street trees) and additional tree planting if necessary.
- Please carefully consider sustainability, additional landscaping and on-site stormwater management.

Parks (Jeanette Krabicka)

- Parkland Dedication
 - a. The amount of parkland dedication that is required is to be calculated as per the City of Ottawa Parkland Dedication By-law No 2009-95 (and as amended or superseded).
 - b. Section 14 (2) (b) of the By-law states that no conveyance of land or payment of money in-lieu is required for a change of use from commercial or industrial to another commercial or industrial use, or for the alteration of an existing building resulting in a change of use from commercial or industrial to another commercial or industrial use.
 - c. The site is currently developed with a commercial/industrial use. The proposed development maintains the commercial/industrial use and includes an addition to the east side of the existing building.
 - d. Therefore, this proposal would be considered exempt from a parkland dedication requirement.
 - e. Please note that the park comments are based on the proposed land use as per the pre-application consultation meeting and should be considered as preliminary. Parks & Facilities Planning comments will be finalized (and subject to change) upon receipt of the development application.
 - f. In addition to the above, Parks and Facilities Planning is currently undertaking a legislated review for the replacement of the Parkland Dedication By-law, with the new by-law to be considered by City Council in early July 2022.

To ensure you are aware of parkland dedication requirements for your proposed development, we encourage you to familiarize yourself with the [existing Parkland Dedication By-law](#) and to

sign up for project notifications on the [Engage Ottawa project page](#) or by emailing the project lead at Kersten.Nitsche@ottawa.ca

- Vegetation
 - If possible, tree planting along the northern property line would be preferred. Deciduous trees provide the most shade and most opportunity for snow storage; however, a mix of deciduous and coniferous trees would also be acceptable from a Parks perspective. Please note: any comments made by the City Forester would take precedence over this Parks comment.

Transportation (Mike Giampa)

- Submit a screening form.
If a TIA is warranted proceed to scoping.
- The application will not be deemed complete until the submission of the draft step 2-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable). Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.
Synchro files are required at Step 4.
- ROW protection on Bill Leathem is 26 m.
Clear throat requirements as per TAC guidelines
Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).

Trees (Mark Richardson)

- A tree conservation report will be required if construction will impact trees greater than 10cm in diameter or city owned trees of any diameter. Please contact the Planning Forester mark.richardson@ottawa.ca for more information.

Conservation Authority (Eric Lalande)

- Please provide enhanced water quality protection
- Water control offsite needs to be documents in the report

Environmental (Sami Rehman)

- Please ensure retention of the newly planted street trees and maintain soft landscaping aspects from the initial building.

Planning Comments (Katie O'Callaghan)

- The project triggers a Standard Site Plan Control Application with no public consultation, the size threshold is under 1,860 square metres.
- As noted, the subject site is designated "Urban Employment Area" on Schedule B, Urban Policy Plan. And in the New OP, the site is designated "Suburban" with a "Mixed-Industrial" land use designation on Schedule B6 – Suburban (Southwest) Transect.
 - In the New OP, low-impact, light industrial uses such as a warehouse are permitted here along with small-scale office less than 10,000 square metres.
- The site falls within the South Nepean Urban Area Secondary Plan and is designated as "Prestige Business Park". The Secondary Plan highlights the importance of both street trees and sidewalks to define the streetscape and encourage pedestrian circulation, respectively.
 - Please consider breaking up the asphalt where possible with some soft landscaping – things that are low maintenance like ornamental grasses, bushes or wildflower gardens as it helps reduce the heat island effect.

- In the Secondary Plan, there is also encouragement of promoting accessibility by all forms of transportation (pedestrians, cycling, public transit and vehicular):
 - Please consider adding EV charging stations or future proofing for this as a significant portion of the site is geared for vehicular use.
- The City's preference would be to have the building entrance front 2 Bill Leathem Drive to match the existing Canada Post condition to the west.
- As discussed, a planning cover letter will be accepted for this submission.

Submission requirements and fees

- A Site Plan Control (standard) application is needed. Please see webpage here for more [details](#).
- Plans are to be standard A1 size (594 mm x 841 mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
- All PDF submitted documents are to be unlocked and flattened.
- Ensure that all plans and studies are prepared as per City guidelines – as available online:
<https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans>

Next steps

- Planning staff encourage you to discuss the proposal with the local ward councillors Carol Anne Meehan as well as the adjacent ward councillor Keith Elgi and any impacted community groups and neighbours.

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Legend: **S** indicates that the study or plan is required with application submission.

A indicates that the study or plan may be required to satisfy a condition of approval/draft approval.

For information and guidance on preparing required studies and plans refer [here](#):

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S	15	1. Site Servicing Plan	2. Site Servicing Study / Assessment of Adequacy of Public Services	S	3
S	15	3. Grade Control and Drainage Plan	4. Geotechnical Study / Slope Stability Study	S	3
	2	5. Composite Utility Plan	6. Groundwater Impact Study		3
	3	7. Servicing Options Report	8. Wellhead Protection Study		3
	9	9. Transportation Impact Assessment (TIA)	10. Erosion and Sediment Control Plan / Brief	S	3
S	3	11. Storm water Management Report / Brief	12. Hydro geological and Terrain Analysis		3
	3	13. Hydraulic Water main Analysis	14. Noise / Vibration Study		3
	PDF only	15. Roadway Modification Functional Design	16. Confederation Line Proximity Study		3

S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
	15	17. Draft Plan of Subdivision	18. Plan Showing Layout of Parking Garage		2
	5	19. Draft Plan of Condominium	20. Planning Rationale / Planning Cover Letter	S	3
S	15	21. Site Plan	22. Minimum Distance Separation (MDS)		3
	15	23. Concept Plan Showing Proposed Land Uses and Landscaping	24. Agrology and Soil Capability Study		3
	3	25. Concept Plan Showing Ultimate Use of Land	26. Cultural Heritage Impact Statement		3
S	15	27. Landscape Plan	28. Archaeological Resource Assessment Requirements: S (site plan) A (subdivision, condo)		3
	2	29. Survey Plan	30. Shadow Analysis		3
S	3	31. Architectural Building Elevation Drawings (dimensioned)	32. Design Brief (includes the Design Review Panel Submission Requirements)	S	Available online
	3	33. Wind Analysis			

S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
	3	34. Phase 1 Environmental Site Assessment	35. Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		3
	3	36. Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	37. Assessment of Landform Features		3
	3	38. Record of Site Condition	39. Mineral Resource Impact Assessment		3
S	3	40. Tree Conservation Report	41. Environmental Impact Statement / Impact Assessment of Endangered Species		3
	3	42. Mine Hazard Study / Abandoned Pit or Quarry Study	43. Integrated Environmental Review (Draft, as part of Planning Rationale)		3

S/A	Number of copies	ADDITIONAL REQUIREMENTS		S/A	Number of copies
S	1	44. Applicant's Public Consultation Strategy (may be provided as part of the Planning Rationale)	45. Site Lighting Plan		3
A	1	46. Site Lighting Certification Letter	47.		

Meeting Date: 02-04-2022

Application Type: *Site Plan Control*

File Lead: Katie O'Callaghan

Infrastructure Approvals Project Manager: Sharif Golam

Site Address: 2 Bill Leatham Drive

*Preliminary Assessment: 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

*One (1) indicates that considerable major revisions are required before a planning application is submitted, while five (5) suggests that proposal appears to meet the City's key land use policies and guidelines. **This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.**

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, the Planning, Real Estate and Economic Development Department 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 Planning, Real Estate and Economic Development Department.

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: December 2, 2020 3:50 PM
To: Curtis Melanson <c.melanson@mcintoshperry.com>
Cc: Shillington, Jeffrey <jeff.shillington@ottawa.ca>
Subject: FW: 2 Bill Leathem Drive development in City of Ottawa

Good day Curtis,

I have received confirmation from the MECP that an ECA would not be required as long as the site is there is no storage or fuel or vehicle repairs. (see email below).

Would you still be pursuing the ECA. I am awaiting sign-off from the senior engineer.

Thanks,

Rubina

Rubina Rasool, E.I.T.

Project Manager

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review - West Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1 rubina.rasool@ottawa.ca

From: Warnock, Charles <Charles.Warnock@ottawa.ca>

Sent: December 02, 2020 11:40 AM

To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>

Subject: 2 Bill Leathem Drive development in City of Ottawa

Hi Rubina, no ECA required as per email below.

Thanks.

Charles

From: Ahmed, Aziz (MECP) <Aziz.Ahmed@ontario.ca>

Sent: December 02, 2020 11:31 AM

To: Warnock, Charles <Charles.Warnock@ottawa.ca>

Cc: Hart, Tracy <Tracy.Hart@ontario.ca>; Primeau, Charlie <Charlie.Primeau@ontario.ca>

Subject: RE: 2 Bill Leathem Drive development in City of Ottawa

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.

Charles,

I am well, hope the same with you. Based on your description below, I agree that the stormwater facility meets the criteria for ECA exemption under R525/98.

Regards,

Aziz

Aziz S. Ahmed, P.Eng. | Manager

Municipal Water and Wastewater Permissions Section, Environmental Permissions Branch | Environmental Assessment and Permissions Division

Ministry of the Environment, Conservation and Parks | 40 St. Clair Ave. West, 2nd Floor, Toronto, ON M4V 1M2

Tel: 416.314.4625 | Cell: 416.712.7427 | Toll Free: 1-888-999-1305 | Fax: 416.314.1037 ✉: Aziz.Ahmed@ontario.ca

If you have any accommodation needs or require communication supports or alternate formats, please let me know.

Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

From: Warnock, Charles <Charles.Warnock@ottawa.ca>
Sent: December-02-20 11:14 AM
To: Ahmed, Aziz (MECP) <Aziz.Ahmed@ontario.ca>
Subject: 2 Bill Leathem Drive development in City of Ottawa

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Aziz, I hope you are well.

The subject site is located to the southwest of the intersection of Longfields Drive and Bill Leathem Drive, within the South Merivale Business Park. The site is an irregularly shaped parcel that has an area of 12,114 square metres. The site is abutting a natural feature with an Open Space Official Plan designation directly to its southwest. There are vacant lands to the site's north and west.

The subject lands are currently undeveloped. The northern portion of the site, with frontage on Bill Leathem Drive, has been cleared and graded. The southern 'triangular' portion of the site is a wooded area that has steep slopes adjacent to a watercourse which cuts through the lot.

The proposal by 1850591 Ontario Ltd (Pat Hunter) is to develop the site with an 1,858 square-metre single storey building for associated office and warehouse uses on its northern portion. The building will consist of two units, each with separate entrances on the front of the building and three loading spaces at the rear of the site. The site will be accessed by two in-and-out accesses onto Bill Leathem Drive.

The proposal also includes 42 surface parking spaces, two of which will be dimensioned to meet accessibility standards. The site plan also proposes vegetation, a garbage enclosure structure, and one post and ring bicycle parking spot. The perimeter of the surface parking lot will be landscaped with rock boulder elements to address the grading of the site.

The site meets the definition of O.Reg. 525/98 Industrial Land. The site is zoned Light Industrial however the zoning has no bearing on the requirement for an Industrial ECA.

The applicant has indicated the warehouse would be for the storage of personal protective equipment and not for the storage of fuel or vehicle repair. The drainage would be from the parking areas, roof, soft landscaping to the onsite stormwater management pond before being released into the municipal storm sewer. On site quantity control is required. Quality control will be provided down stream at the Clarke Bellinger Stormwater Facility.

Will the MECP exempt this site from an Industrial Sewage Works?

If the MECP deems the effluent as non Industrial then proposed warehouse at 2 Bill Leathem Drive in the City of Ottawa would then be exempted from an ECA for the following reasons highlighted in red below:

R525 (Approval Exemptions)

1. (a) is designed to service one lot or parcel of land;

Yes.

2. (b) discharges into a storm sewer that is not a combined sewer;
Yes, City of Ottawa storm sewer to the Clarke Bellinger Stormwater Facility
3. (c) does not service industrial land or a structure located on industrial land; and
MECP deems Industrial ECA not required.
The lands are zoned to permit Light Industrial
The applicant has indicated the warehouse would be for the storage of personal protective equipment and not for the storage of fuel or vehicle repair. The drainage would be from the parking areas, roof, soft landscaping to the onsite stormwater management pond before being released into the municipal storm sewer.
4. (d) is not located on industrial land.
MECP deems Industrial ECA not required.
The lands are zoned to permit Light Industrial

Please let me know if you require additional information.

Thank you,

Charles Warnock

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APPENDIX C WATERMAIN CALCULATIONS

McINTOSH PERRY

CP-20-0023-01 - 2 Bill Leathem - Water Demands

1 of 4

Project:	2 Bill Leathem Drive
Project No.:	CP-20-0023-01
Designed By:	FV
Checked By:	NBV
Date:	February 22, 2022
Site Area:	1.21 gross ha

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	350	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 Parks 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
Othe Commercial	28,000	L/gross ha/d
AVERAGE DAILY DEMAND	0.49	L/s

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	2.5 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	0.74	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	2.2 x max. 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	1.32	L/s

WATER DEMAND DESIGN FLOWS PER UNIT COUNT
CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

CP-20-0023-01 - 2 Bill Leathem - OBC Fire Calculations

2 of 4

Project:	2 Bill Leathem
Project No.:	CP-20-0023-01
Designed By:	FV
Checked By:	NBV
Date:	February 22, 2022

Ontario 2006 Building Code Compendium (Div. B - Part 3)

Water Supply for Fire-Fighting - Office & Warehouse Building

Building is classified as Group : D and F2 up to 2 Storeys (from table 3.2.2.55)

Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with subsections 3.2.2., including loadbearing walls, columns and arches

From Div. B A-3.2.5.7. of the Ontario Building Code - 3. Building On-Site Water Supply:

(a) $Q = K \times V \times Stot$

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

Stot = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

Stot = 1.0 + [Sside1+Sside2+Sside3+...etc.]

K	17	(from Table 1 pg A-31) (Worst case occupancy {E / F2} 'K' value used)
V	12,864	(Total building volume in m ³ .)
Stot	1.2	(From figure 1 pg A-32)
Q =	262,425.60 L	

From
Figure 1
(A-32)

Snorth	19.82	m	0.0
Seast	8.33	m	0.2
Ssouth	23.57	m	0.0
Swest	31.9	m	0.0

*approximate distances

From Table 2: Required Minimum Water Supply Flow Rate (L/s)

6300 L/min (if Q >190,000 L and Q < 270,000 L)
1664 gpm

McINTOSH PERRY

CP-20-0023-01 - 2 Bill Leathem - Fire Underwriters Survey (FUS) Fire Calculations

3 of 4

Project:	2 Bill Leathem
Project No.:	CP-20-0023-01
Designed By:	FV
Checked By:	NBV
Date:	February 22, 2022

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:

$F = 220 \times C \times \sqrt{A}$ 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.

A. Determine The Coefficient Related To The Type Of Construction

The building is considered to be of ordinary construction type. Therefore,

C = 1.00

B. Determine Ground Floor Area

As provided by the Architect:

Floor Area (One Floor) = 3,216.00 m²

A = 3,216.00 m²

This floor area represents the final build-out of the development; as outlined on the Site Plan drawing.

C. Determine Height in Storeys

From Architectural Drawings:

Number of Storeys = 1.00

D. Calculate Required Fire Flow

$F = 220 \times C \times \sqrt{A}$

F = 220.00 X 1.00 X $\sqrt{3216.00}$

F = 12,476.15 L/min.

E. Determine Increase or Decrease Based on Occupancy

From note 2, Page 18 of the Fire Underwriter Survey:

Low Hazard Light Industrial

No Change

Occupancy Decrease = 0.00 L/min.

F = 12,476.15 L/min.

McINTOSH PERRY

CP-20-0023-01 - 2 Bill Leathem - Fire Underwriters Survey (FUS) Fire Calculations

4 of 4

F. Determine the Decrease, if any for Sprinkler Protection

From note 3, Page 18 of the Fire Underwriter Survey:

- The flow requirement may be reduced by up to 50% for complete automatic sprinkler protection depending upon adequacy of the system.
- The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards.
- Additional credit of 10% if water supply is standard for both the system and fire department hose lines
- If sprinkler system is fully supervised system, an additional 10% credit is granted
- There will be no sprinkler system
- Therefore the value obtained in Step E is reduced by 0% (The building is sprinklered with a standard system and fire department hose lines)

$$\text{Reduction} = 12,476.15 \text{ L/min.} \times 0\%$$

$$\text{Reduction} = 0.00 \text{ L/min.}$$

G. Determine the Total Increase for Exposures

From note 4, Page 18 of the Fire Underwriter Survey:

- Exposure distance to the south is 33m
- There are no existing buildings surrounding the remainder of the site that are within 45m.
- Therefore the charge for exposure is 5% of the value obtained in Step E.

$$\text{Increase} = 12,476.15 \text{ L/min.} \times 5\%$$

$$\text{Increase} = 623.81 \text{ L/min.}$$

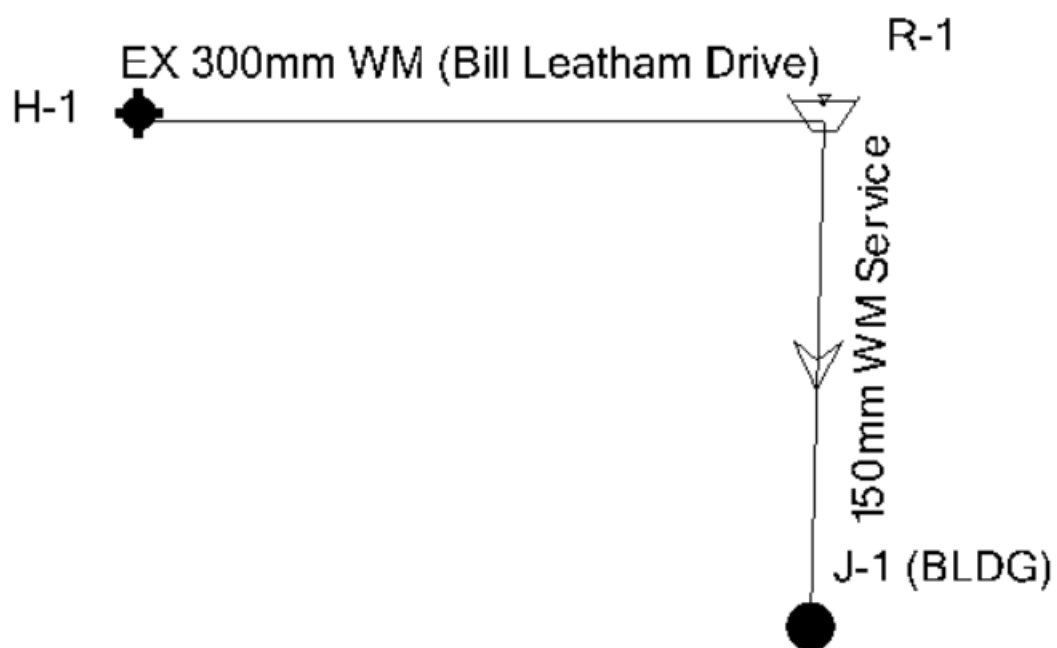
H. Determine the Total Fire Demand

- To the answer obtained in E, subtract the value obtained in F and add the value obtained in G
- Fire flow should be no less than 2,000L/min. and the maximum value should not exceed 45,000L/min.

$$F = 12,476.15 \text{ L/min.} - 0.00 \text{ L/min.} + 623.81 \text{ L/min.}$$

$$F = 13,099.96 \text{ L/min.}$$

Therefore, after rounding to the nearest 1,000 L/min, the total required fire flow for the development is 13,000 L/min (2,642 GPM).



Active Scenario: Average Day - Existing Conditions

Label	Elevation (m)	Demand (L/min)	Pressure (psi)	Hydraulic Grade (m)
J-1 (BLDG)	88.83	29.40	62.41	132.80

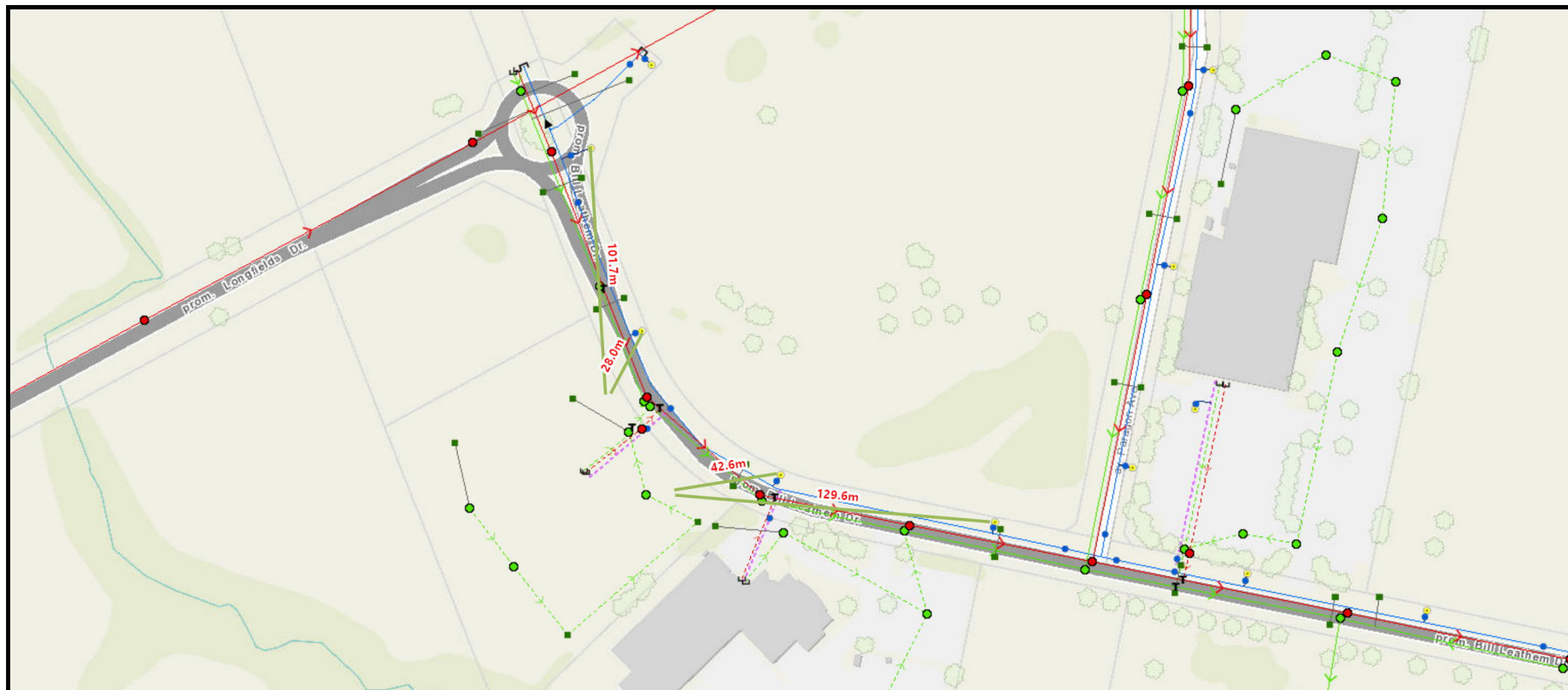
Active Scenario: Peak Hourly - Existing Conditions

Label	Elevation (m)	Demand (L/min)	Pressure (psi)	Hydraulic Grade (m)
J-1 (BLDG)	88.83	79.20	51.34	125.00

Active Scenario: Max Day + Fire Flow - Existing Conditions

Label	Is Fire Flow Run Balanced?	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/min)	Fire Flow (Available) (L/min)	Pressure (psi)	Elevation (m)	Demand (L/min)	Pressure (Residual Lower Limit) (psi)
H-1	True	True	13,000.00	14,707.29	35.91	87.70	0.00	20.00

Hydrant Cover Figure



APPENDIX D
SANITARY SEWER CALCULATIONS

Project:	CP-20-0023-01 – 2 Bill Leathem Drive
Designed By:	NBV
Checked By:	RDF
Date:	March 18, 2022

Re: Sanitary Flow Calculations

1. Building Occupancy

The building addition is of the light industrial type with an area of 1379m². Including the existing building, the building area is 3216m².

2. Daily Volume in Litres

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

- Average Heavy Industrial Flow: 35,000 L/gross ha/d

3. Peak Flow (Q/p)

- $Q_{IND}(p) = F_{IND} \times P_{IND}$

Where:

F_{IND} = 35,000 Litres/Gross Hectare/Day (as per City of Ottawa Sewer Design Guidelines)

P_{IND} = 1.21 Hectares (Development Area)

- Therefore, $Q_{IND}(p) = (35,000) \times (1.21) = \mathbf{42,350 \text{ L/Day}}$
 $\mathbf{= 0.49 \text{ L/sec}}$

It is expected that the existing 250mm diameter Sanitary Main within Bill Leathem Drive has the capacity to accommodate the new flows.

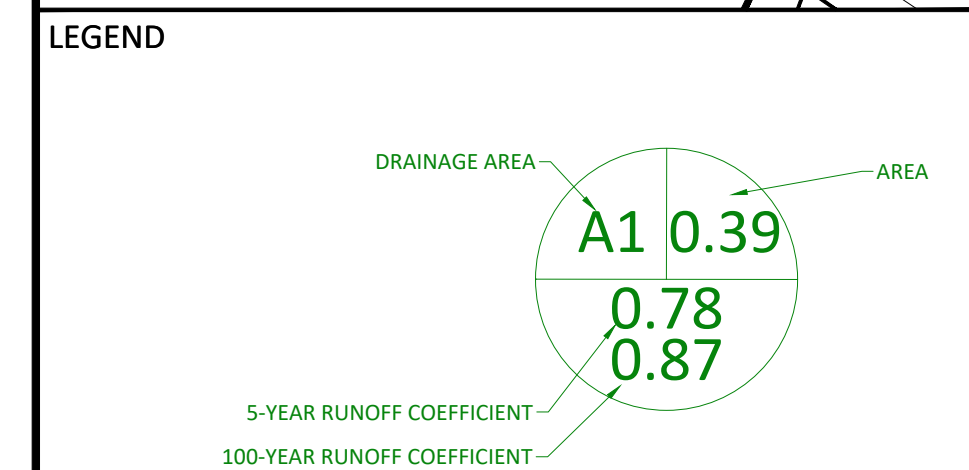
SANITARY SEWER DESIGN SHEET

PROJECT: 2 Bill Leathem Drive
LOCATION:
CLIENT: BBS Construction Ltd



LOCATION				RESIDENTIAL								ICI AREAS								INFILTRATION ALLOWANCE			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	23	24	25	26	27	28	29	30	31							
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES				AREA (ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)						PEAK FLOW (L/s)	AREA (ha)		FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY								
				SF	SD	TH	APT		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM								IND	CUM	L/s	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s
								IND					CUM	IND	CUM	IND	CUM																				
	B1-B5	Proposed Addition	Ex. MH1A						0.0	0.0	4.00	0.00		0.00		0.00	1.21	1.21	0.49	1.21	1.21	0.40	0.89	22.47	5.80	150	2.00	1.232	21.58	96.04							
		Ex. MH1A	Ex. 250mm						0.0	0.0	4.00	0.00		0.00		0.00	1.21	1.21	0.49	1.21	1.21	0.40	0.89	22.47	10.96	150	2.00	1.232	21.58	96.04							
Design Parameters:				Notes:								Designed:				NBV				No.	Revision							Date									
Residential				ICI Areas																1.	Issued for Review							2022.03.18									
SF	3.4	p/p/u																																			
TH/SD	2.7	p/p/u																																			
APT	2.3	p/p/u																																			
Other	60	p/p/Ha																																			
																			</																		

APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

[illegible]

Check and verify all dimensions before proceeding with the work	Do not scale drawing
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McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com



Drawing Title:

PRE-DEVELOPMENT DRAINAGE PLAN

Scale:	1:300	Project Number:	CP-20-0023-01
Drawn By:	N.B.V.		
Checked By:	C.J.M.	Drawing Number:	PRE
Designed By:	C.J.M.		

APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

CP-20-0023-01 - Bill Leathem - Runoff Calculations

1 of 3

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} 5-Year	C _{AVG} 100-Year
A1	1.21	0.00	0.90	0.00	0.60	12,080.27	0.20	0.20	0.25

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	I (mm/hr)		Q (L/s)	
					5-Year	100-Year	5-Year	100-Year
A1	1.21	0.20	0.25	20	70.3	120.0	47.19	100.71
Total	1.21						47.19	100.71

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} 5-Year	C _{AVG} 100-Year
B1	0.36	3,175.02	0.90	0.00	0.60	402.98	0.20	0.82	0.92
B2	0.35	3,395.00	0.90	0.00	0.60	91.00	0.20	0.88	0.98
B3	0.12	0.00	0.90	0.00	0.60	1,179.47	0.20	0.20	0.25
B4	0.24	1,336.91	0.90	0.00	0.60	1,038.09	0.20	0.59	0.67
B5	0.15	0.00	0.90	0.00	0.60	1,494.00	0.20	0.20	0.25

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	0.36	0.82	0.92	10	104.2	178.6	85.10	162.61
B2	0.35	0.88	0.98	10	104.2	178.6	89.03	169.66
B3	0.12	0.20	0.25	10	104.2	178.6	6.83	14.64
B4	0.24	0.59	0.67	10	104.2	178.6	40.87	79.25
B5	0.15	0.20	0.25	10	104.2	178.6	8.65	18.54
Total	1.21						230.49	444.69

Required Restricted Flow

Drainage Area	Area (ha)	C 5-Year	Tc (min)	I (mm/hr)	Q (L/s)
				5-Year	5-Year
A1	1.21	0.65	15	83.6	182.40

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	85.10	162.61	76.32	80.51	62.79	183.03	63.01	183.30
B2	89.03	169.66						
B3	6.83	14.64						
B4	40.87	79.25	40.87	79.25	0.00	0.00	0.00	0.00
B5	8.65	18.54	8.65	18.54	0.00	0.00	0.00	0.00
Total	230.49	444.69	125.84	178.30	62.79	183.03	63.01	183.30

McINTOSH PERRY

CP-20-0023-01 - Bill Leathem - STORAGE REQUIREMENTS

2 of 3

Storage Requirements for Area B1-B3

5-Year Storm Event

Tc (min)	I (mm/hr)	B1 Runoff (L/s)	B2 Runoff (L/s)	B3 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	85.10	89.03	6.83	76.32	104.65	62.79
15	83.6	68.25	71.40	5.48	76.32	68.81	61.93
20	70.3	57.38	60.03	4.61	76.32	45.70	54.83
25	60.9	49.74	52.03	3.99	76.32	29.45	44.17
30	53.9	44.05	46.08	3.54	76.32	17.34	31.22
35	48.5	39.63	41.46	3.18	76.32	7.95	16.69
40	44.2	36.09	37.76	2.90	76.32	0.42	1.01

Maximum Storage Required 5-Year (m³) = 62.79

100-Year Storm Event

Tc (min)	I (mm/hr)	B1 Runoff (L/s)	B2 Runoff (L/s)	B3 Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	162.61	169.66	14.64	80.51	266.39	159.83
15	142.9	130.13	135.77	11.71	80.51	197.10	177.39
20	120.0	109.23	113.97	9.83	80.51	152.53	183.03
25	103.8	94.57	98.67	8.51	80.51	121.24	181.86
30	91.9	83.66	87.29	7.53	80.51	97.97	176.35
35	82.6	75.20	78.46	6.77	80.51	79.92	167.84
40	75.1	68.43	71.40	6.16	80.51	65.48	157.15

Maximum Storage Required 100-Year (m³) = 183.03

5-Year Storm Event Storage Summary

Water Elev. (m) =		89.74	
INV. (out)	Depth (m)	Volume (m ³)	Head (m)
87.62	0.24	63.0	2.04

Storage Available (m³) = 63.0

Storage Required (m³) = 62.8

100-Year Storm Event Storage Summary

Water Elev. (m) =		89.97	
INV. (out)	Depth (m)	Volume (m ³)	Head (m)
87.62	0.47	183.3	2.27

Storage Available (m³) = 183.3

Storage Required (m³) = 183.0

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CP-19-0530 - BBS Office - Runoff Calculations

3 of 3

For Orifice Flow, C=

0.60

For Weir Flow, C=

1.84

	Orifice 1	Orifice 2	Weir 1	Weir 2
invert elevation	87.62			
center of crest elevation	87.70			
orifice width / weir length	160 mm			
orifice height				
orifice area (m ²)	0.020	0.000		

Elevation Discharge Table - Storm Routing

Elevation	Orifice 1		Orifice 2		Weir 1		Weir 2		Total Q [l/s]
	H [m]	Q [m ³]	H [m]	Q [m ³]	H [m]	Q [m ³]	H [m]	Q [m ³]	
89.50	1.80	0.072							71.69
89.51	1.81	0.072							71.89
89.52	1.82	0.072							72.09
89.63	1.93	0.074							74.24
89.64	1.94	0.074							74.43
89.65	1.95	0.075							74.62
89.66	1.96	0.075							74.81
89.67	1.97	0.075							75.00
89.68	1.98	0.075							75.19
89.69	1.99	0.075							75.38
89.70	2.00	0.076							75.57
89.71	2.01	0.076							75.76
89.72	2.02	0.076							75.95
89.73	2.03	0.076							76.13
89.74	2.04	0.076							76.32
89.75	2.05	0.077							76.51
89.76	2.06	0.077							76.69
89.77	2.07	0.077							76.88
89.78	2.08	0.077							77.07
89.79	2.09	0.077							77.25
89.80	2.10	0.077							77.44
89.81	2.11	0.078							77.62
89.82	2.12	0.078							77.80
89.83	2.13	0.078							77.99
89.84	2.14	0.078							78.17
89.85	2.15	0.078							78.35
89.86	2.16	0.079							78.53
89.87	2.17	0.079							78.72
89.88	2.18	0.079							78.90
89.89	2.19	0.079							79.08
89.90	2.20	0.079							79.26
89.91	2.21	0.079							79.44
89.92	2.22	0.080							79.62
89.93	2.23	0.080							79.80
89.94	2.24	0.080							79.98
89.95	2.25	0.080							80.15
89.96	2.26	0.080							80.33
89.97	2.27	0.081							80.51
89.98	2.28	0.081							80.69
89.99	2.29	0.081							80.86
90.00	2.30	0.081							81.04
90.01	2.31	0.081							81.22

5-Year

100-Year

Notes: 1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.

2. Orifice Equation: $Q = cA(2gh)^{1/2}$

3. Weir flow calculated in Bentley's FlowMaster - Trapezoidal Channel at 0.8%, 3:1 side slopes, roughness coeff. Of 0.035

4. These Computations Do Not Account for Submergence Effects Within the Pond Riser.

5. H for orifice equations is depth of water above the centroid of the orifice.

6. H for weir equations is depth of water above the weir crest.

STORM SEWER DESIGN SHEET



PROJECT: Office/ Warehouse
LOCATION: 2 Bill Leatham Drive
CLIENT: BBS Constrction Ltd.

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	23	24	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)														(%)						
	B1	EX. CB1	EX. CBMH2	0.82	0.36	0.29	0.29	10.00	0.40	10.40	104.19	122.14	178.56	84.98				84.98	129.34	27.54	375			0.50	1.134	44.35	34.29%
		EX. CBMH2	EX. CBMH3	0.00	0.00	0.00	0.29	10.40	0.44	10.84	102.10	119.68	174.94	83.28				83.28	129.34	29.89	375			0.50	1.134	46.06	35.61%
	B2	EX. CBMH3	EX. DICB4	0.88	0.35	0.31	0.60	10.84	0.46	11.30	99.94	117.13	171.20	166.74				166.74	210.32	35.41	450			0.50	1.281	43.58	20.72%
	B3	EX. DICB4	EX. DICB5	0.20	0.12	0.02	0.62	11.30	0.91	12.22	97.77	114.58	167.45	169.54				169.54	210.32	70.31	450			0.50	1.281	40.77	19.39%
		EX. DICB5	EX. MH7	0.00	0.00	0.00	0.62	12.22	0.54	12.75	93.77	109.87	160.53	162.60				162.60	237.95	46.57	450			0.64	1.449	75.35	31.67%
	B4	EX. MH7	EX STM	0.36		0.00	0.62	12.75	0.12	12.87	91.59	107.30	156.77	158.82				158.82	297.43	12.76	450			1.00	1.812	138.61	46.60%
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]																											

APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST

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"> o Metric scale o North arrow (including construction North) o Key plan o Name and contact information of applicant and property owner o Property limits including bearings and dimensions o Existing and proposed structures and parking areas o Easements, road widening and rights-of-way o 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