# STORMWATER MANAGEMENT REPORT 82 Eccles Street, Ottawa

Prepared by

### **E AU Structural & Environmental Services**

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Revision 1

# Table of Contents

### **1.0 Introduction**

- 2.0 Stormwater Design.
- 3.0 Stormwater Quantity
- 4.0 Erosion and Sediment Control

### **5.0 Conclusion**

Appendixes

Appendix A: Drainage Area Appendix B: Stormwater Management Calculation Appendix C: Plans

### 1. Introduction

EAU Structural and Environmental Services Inc. was retained by Lindsay Blair to prepare a Stormwater Management study for the proposed new residential addition at 82 Eccles, Ottawa. The proposed addition consists of 2 story and a basement unit located in 82 Eccles Street, Ottawa, Ontario.

The pertinent property is currently housing an existing dwelling. The property is 15.70m width by 27.36m depth. Proposed addition has been designed to be environmental friendly with permeable landscape around the building and grass in the rear.

### 2. Stormwater Design

#### 2.1. Design Criteria

Design of the storm sewer system was completed in conformance with the City of Ottawa Design Guidelines (November 2012). Specifically, Section 5 "Storm and Combined Sewer Design" for runoff coefficients and an inlet time were referenced in this design.

The site is currently occupied by an existing residential building with an asphalt driveway. Pre-development conditions will be considered as the lesser of current conditions or conditions resulting in a runoff coefficient of 0.4. Based on the existing ground cover the pre-development runoff coefficient was calculated to be 0.50. However, the predevelopment release rate for the site is calculated using a runoff coefficient of 0.40, the 5 year storm event, time of concentration of 10 min and store up to the 100 years storm event as per direction from City of Ottawa Sewer Design Guideline.

During all construction activities, erosion and sediment shall be controlled by techniques outlined in Section 5 of this report.

#### 2.2. Calculation and Design Criteria

• The storm water is calculated based on the rational formula and the Manning's Equation under free flow conditions for the 5-year and 100-year storm events.

#### 2.3. Runoff Coefficients

The area for runoff coefficients used for either pre-development or post-development conditions were based on actual areas measured in CAD. Runoff coefficients for impervious surfaces such as roofs, asphalt, and concrete, were taken as 0.90 and for permeable landscape 0.3.

The pre-development runoff coefficients for the overall site is based on C=0.40 in general this includes grass and tree areas.

#### 2.4. Predevelopment Release Rate

Predevelopment release rate from the site was determined using the modified rational method with a 5 years storm, a runoff coefficient C=0.4, and a time of concentration of 10 minutes as follows;

- Time of Concentration = 10 minutes,
- Drainage Area = 0.035 ha

Q allow = 
$$2.78 \text{ C I A}$$

Where:

Q allow	=	Predevelopment release rate to storm sewer (L/sec)
С	=	Runoff Coefficient (dimensionless) =0.4
Ι	=	Average Rainfall Intensity for return period (mm/hr)
	=	998.071/ (TC+6.053)0.814 (5-year) =104.2 mm/hr
TC	=	Time of concentration (minutes)
А	=	Drainage Area (hectares) $= 0.043$

Q Allow = 4.98 L/sec

Therefore the predevelopment release rate from the site is 4.98 L/sec

### 3. Stormwater Quantity

Post development storm water management design for this site includes 3 general areas; Grass area, Roof and Permeable Landscape area.

- Grass area will sheet drain to rear of the property as per natural drainage pattern. During 5 year and 100 year storm event, grass area generates 1.29 L/sec and 1.61 L/sec respectively.
- Any access rain from Permeable Landscape area will sheet drain to rear or Eccles Street, During 5 year and 100 year storm event, this area generates 0.89 L/sec and 1.19 L/sec respectively.
- Roof (existing and new addition): The roof discharge rate is calculated as 10.72 L/sec. City of Ottawa official agreed that no control is required due to fact the site is a small lot with combination and existing and proposed development that makes no room for storage or convey the storm water to City storm main on the Right of way.

### 4. Erosion and Sediment Control

During all construction activities, erosion and sedimentation shall be controlled by the following techniques:

- Installation of filter cloth between frame and cover of catch basins,
- A visual inspection shall be completed daily on sediment control barriers and any damage repaired immediately. Care will be taken to prevent damage during construction operations,
- In some cases barriers may be removed temporarily to accommodate the construction operations. The affected barriers will be reinstated at night when construction is completed,
- The sediment control devices will be cleaned of accumulated silt as required. The deposits will be disposed of as per the requirements of the contract,
- During the course of construction, if the engineer believes that additional prevention methods are required to control erosion and sedimentation, the contractor will install additional silt fences or other methods as required to the satisfaction of the engineer, and
- Construction and maintenance requirements for erosion and sediment controls to comply with Ontario Provincial Standard Specification OPSS 577, and City of Ottawa specifications.

### 5. Conclusions

This report discuss the storm water management of the proposed site. The proposed 0.043 hectare development, consists of 2 storey with a basement building. The following list below itemizes the conclusions of this report.

- Predevelopment release rate for the site is calculated using a runoff coefficient of 0.40, the 5 year storm event, time of concentration of 10 min. Predevelopment discharge rates of 4.98 L/sec for the 5-year is calculated from this site.
- Grass area will sheet drain to rear of the property as per natural drainage pattern. During 5 year and 100 year storm event, grass area generates 1.29 L/sec and 1.61 L/sec respectively.
- Any access rain from Permeable Landscape area will sheet drain to rear or Eccles Street, During 5 year and 100 year storm event, this area generates 0.89 L/sec and 1.19 L/sec respectively.
- Roof (existing and new addition): The roof discharge rate is calculated as 10.72 L/sec. City of Ottawa official agreed that no control is required due to fact the site is a small lot with combination and existing and proposed development that makes no room for storage or convey the storm water to City storm main on the Right of way.
- During all construction activities, erosion and sedimentation shall be controlled be techniques outlined in this report.

Should you have any question, do not hesitate to let us know.

Derrick R. Clark, PEng. EAU Structural & Environmental Services Telephone: (613) 869 0523 <u>derrick.r.clark@rogers.com</u>



## APPENDIX A:

## Storm Drain Area



# APPENDIX B:

# Stormwater Management Calculation

C(max equiv)	l (5yr) mm/h	Area (ha)	
0.4	104.2	0.043	
Q(allow)	4.98	l/s	

#### SUMMARY OF STORMWATER FLOWS

Area ID	Area (ha)	Runoff 'C'	AxC	C (100yr) (Max of 1.0)	AxC	Type of Flow (Controlled/Uncontrolled)
A1: Proposed Building	0.024	0.9	0.0216	1.0	0.0240	
A2: Permeable Landscape	0.006	0.3	0.0018	0.4	0.0023	
A3: Grass area	0.013	0.2	0.0026	0.25	0.0033	
Total Site Area (ha)	0.043	22	0.0260		0.0295	Total

C(avg) 5-year = 0.60 C(avg) 100-year = 0.69

# APPENDIX C:

# PLANS

#### City of Ottawa Comprehensive Zoning By-law (2008-250)

The subject property is zoned Residential Fourth Density – Subzone H (R4H). The intent of this R4 Zone is to allow a wide mix of residential building forms, including low rise apartment dwellings, up to a height of four storeys in lands designated "General Urban Area" in the Official Plan.

The following performance standards apply to the subject property, with the right column indicating conformity: Brovision Deufeum co Standard Due . .

Provision	Performance Standard	Proposed	
Lot Width (m)	Min: 12 m	15.7 m	✓
Lot Area (m <sup>2</sup> )	Min: 360 m <sup>2</sup>	429 m <sup>2</sup>	~
Height (m)	Max: 11 m*	7.81 m	~
Front Yard Setback (minimum)	Non-conforming existing setback: 1.15 m For additions: average of abutting lots: (0.91+2.13)/2 = 1.52 m, capped at 3 m	1.15 m 3.15 m	✓ ✓
Rear Yard Setback (m)	Min. 30% of lot depth: 27.33*0.3 = 8.2 <b>m</b> 25% of lot area: (7.9*15.68)/429 = 0.28	7.9 m 28%	X ✓
Interior Side Yard (m)	Non-complying right for east wall varies: 0 m Min. 1.5 for the first 21 m, then 6 m	E: 0 m W: 1.17 m	E: ✓ W: <b>x</b>
Projections	Stairs: where at or below the floor level of the first floor in the interior side yard or rear yard: no limit	Rear stairs: 2.41 m	~
Unit count	Max. 4 units permitted for "apartment, low-rise" use	6 units	x
Parking (Area X)	Residential + Visitor: none for first 12 units = 0 spaces	0 space	$\checkmark$

**Required bicycle** parking

Walkways

Waste managemer

Landscaping

#### Amenity Area

required front and rear yard setbacks)

### **Requested Minor Variances**

- apartment, low rise;
- 2.
- any new additions; 3.

4.



(01) SITE PLAN A0) SCALE: 1/8"=1' 0"

	<b>0.5 per uni</b> t: 0.5*6 = <b>3 spaces</b> 50% horizontal, may be located in any yard, max. 15 spaces in landscaped area	6 spaces	~
	Must extend from driveway to door or sidewalk to door max. 1.25 m width	Width: 1.2 m	$\checkmark$
nt	Min. 1.2 m path to street Storage as per Solid Waste Management By-law Min 2.2 m path to yard bin	1.17 m path to street, Compliant Compliant	X √ √
	Min. 30% of lot area: 429*0.3 = 128.7 m <sup>2</sup>	40% soft landscape (173 m²)	✓
	15m <sup>2</sup> /unit for first 8 units: 15*6=90 m <sup>2</sup> 100% of required area must be communal, 80% soft landscaped (72 m <sup>2</sup> ) and located at-grade in rear yard	91 m <sup>2</sup> communal 91 m <sup>2</sup> (100%) soft landscaped	$\checkmark$

\*Building height measured based on existing average grade (average of grade elevations at both side lot lines at

In order to permit the proposed development, relief from several provisions of the Zoning By-law is required. Relief from the following provisions is therefore requested through the enclosed Minor Variance Application: 1. To permit a total of six units, whereas the Zoning By-law permits a maximum of four units for an

To permit a reduced west side yard setback of 1.17 metres whereas a 1.5 metre setback is required for

To permit a reduced rear yard setback of 29% of the lot depth (7.9 m) whereas the Zoning By-law requires a minimum rear yard setback of 30% of the lot depth (8.2 m);

To permit a reduced path width of 1.17m to access waste and bicycle parking whereas the Zoning By-law requires a minimum width of 1.2m.

![](_page_11_Picture_25.jpeg)

#	REVISION	DATE
01	ISSUED FOR CITY REVIEW	08/20/19
02	REVISION	09/04/19

The undersigned has reviewed and takes responsibility for this design and has the qualifications and meets the requirements setout in the Ontario Building Code to design the work shown in the attached documents.				
	DESIGNER	BCIN		
DRAWN BY	O. GAUTHIER			
CHECK BY		BCIN		
	PLANNING			
	82-84 ECCLES STREET			
	CONSTRUCTION NOTES, ASSEMBLIES & SITE PLAN			
SCALE	AS SHOWN	٨٥		
DATE	SEPT 04 2019			

![](_page_12_Figure_0.jpeg)

![](_page_13_Figure_0.jpeg)

![](_page_13_Picture_1.jpeg)

SEPT 04 2019

![](_page_14_Figure_0.jpeg)

![](_page_15_Figure_0.jpeg)

# **Construction Notes:**

- -- Water lateral : 5m of 25mm diameter soft K type Copper
- -- Sanitary lateral :135mm diameter PVC SDR 28
- -- Storm lateral :100mm diameter PVC SDR 28 -- Back water valve to be installed as per City of Ottawa Sewer Design Guideline.
- -- The laterals must be sleeved when passing below footing -- The storm lateral shall not gravity drain - a sump pump and backwater valve are to be installed.
- +1. Front eavestroughes for dwelling shall be directed towards front of the property.
- +2. No excess drainage will be directed towards the neighboring properties during and after construction.
- +3. There must be no proposed alterations to grades on, or beyond the property line.
- +4. This drawing is not for construction unless approved by relevant authorities.
- +5. Existing trees to be protected during and after construction. +6. Services with 2.4 of the existing CB to be insulated as per City of Ottawa
- Standard Drawing W23 +7. Existing water lateral shall be capped at the main and existing sewer
- lateral shall be capped at property line. Refer to City of Ottawa Std DWG S11.4 for capping of service laterals +8. Backwater valves should be provided as per City of Ottawa Standard
- Drawings S14, S14.1, S14.2. +9. Under side of footing less than 1.5 below grade shall be insulated.
- +10. Services shall have a minimum of 2.4m of cover from the finished
- grade or shall be insulated as per City of Ottawa Standard Drawing W22. +11. All roof runoff to be directed to the City Right-of-Way. No excess
- drainage shall be directed to neighbouring properties.
- +12. All curb and side walk located in ROW shall be reinstated as per City of Ottawa standard drawings and regulations, S.C 1.4
- +13. Hard surface areas and driveway are to be reinstated to soft landscaping
- +14. Downspouts located within 1.5m of a property line must be equipped with a splash pad.
- +15. Grading is to be between 2-7% or terracing is required. Terracing shall be to a maximum of 3H:1V.
- +16. Easement verification is the responsibility of the applicant. Easement information can be obtained from the Land Title and may be registered at the Ontario Land Registry Office. Written consent is required from the easement holders to permit encroachment or modifications within the easement.
- +17. Where the invert elevation for the proposed service laterals will be less than 0.3m below the USF, or will pass through the foundation/footing, the laterals must be sleeved
- +18. Existing speed hump on Eccles Ave shall be reinstated per City of Ottawa Standard Drawing R19 if disrupted during service installation or blanking/capping.

(Formerly Alice Street)

![](_page_15_Picture_26.jpeg)

Scale 1:150

3.0 1.5

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND

CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

Notes & Legend

..

SIF

CC

CP

(WIT)

(AOG)

Meas.

(P1)

(P4)

ΟUΡ

• AN

🗖 GM

οВ

⊗ DS

"

**REVISION DESCRIPTION** 

FOR REVIEW

FOR PERMIT

REVISED REVISED

NSULTANT

Structural Environme Services

PRCIACK

D. R. CLARK

54/19/

PER CITY COMMENT

Derrick Clark

Professional engineer.

Email : derrick.r.clark@rogers.com

Tel. : 613- 869- 0523

SSIB

Denotes Survey Monument Planted

Iron Bar

Witness

Measured

Cut Cross

Concrete Pin

Standard Iron Bar

Registered Plan 55

Plan 4R-20351

Plan 4R-25409

Plan 5R-11642

Chain link Fence

Board Fence

Utility Pole

Gas Meter

Downspout

Water Shut off Valve

DATE

MAY 08, 2018

JULY 10, 2018

MARCH 10, 2019 MARCH 25, 2019

April 11, 2019

G<sup>1</sup>

Anchor

Bollard

Survey Monument Found

Short Standard Iron Bar

Annis, O'Sullivan, Vollebekk Ltd.

(647) Plan October 19, 2010

(725) Plan June 12, 1986

(AOG) Plan May 31, 1984

6 Metres

4.5

Metric