PROPOSED THREE STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 31

R-PLAN 294

1058, 1062 AND 1066 SILVER STREET

CITY OF OTTAWA

APPLICATION FILE No. : D07-12-21-0112 ; D02-02-21-0073

STORM DRAINAGE REPORT

REPORT R-821-10 (REVISION 2)

FEBRUARY 2023

T.L. MAK ENGINEERING CONSULTANTS LTD.

JULY 2021

REFERENCE FILE NUMBER 821-10

Introduction

The proposed three storey apartment building site is located at the northwest corner of Silver Street and Summerville Avenue. The said re-development property is an amalgamation of (3) lots known as 1058, 1062 and 1066 Silver Street. Total area of the site is 1,579.54 m^2 or 0.158 ha. Presently, there are (3) one-storey stucco/vinyl siding dwelling units currently occupying the residential lots.

The site under consideration is situated on the north side of Summerville Avenue, west of Silver Street and is south of Dorchester Avenue. Its legal property description is Part of Lot 31 Registered Plan 294 City of Ottawa located in Ward 16 (River).

The proposed building is a 32 unit – (3) storey residential apartment building with underground parking. Barrier free entrance of this building will face onto Summerville Avenue and the main entrance will face Silver Street. See site plan details in **Appendix A**.

The ±11.0m high apartment building contains sixteen 1-bedroom + den units, five 1-bedroom and eleven 2-bedroom units. Each floor covers an area of 10,616 ft^2 (±986 m^2) for a gross floor area of 31,849.0 ft^2 (2,957 m^2). Stormwater outlet for this site is the existing 300mm diameter Summerville Avenue storm sewer located within the Summerville Avenue road right of way. Stormwater from this sewer is then routed north to the existing 375mm diameter Silver Street storm sewer which in turn further routes flow to the north into the existing 750mm diameter storm sewer on Shillington Avenue.

From storm drainage criteria set by the staff at the City of Ottawa's Engineering Department, the allowable post-development runoff release rates shall not exceed the two (2)-year pre-development conditions. The allowable pre-development runoff coefficient is the lesser of the calculated "C" existing value or C = 0.5 maximum. If the uncontrolled stormwater runoff exceeds the specified requirements, the on-site stormwater management (SWM) control measures are necessary. The post-development runoff coefficient for this site is estimated at C = 0.74, which exceeds the pre-development allowable C_{pre} = 0.43 criteria for the Summerville Avenue storm sewer without on-site SWM control. Therefore, SWM measures are required. Refer to the attached Drainage Area Plan (Figure 1) as detailed in **Appendix B**.

This report will address and detail the grading, drainage, and stormwater management control measures required to develop this property. Based on the Proposed Site Grading and Servicing Plan (Dwg. No. 821-10 G-1) and the Proposed Rooftop Stormwater Management Plan (Dwg. No. 821-10 SWM-1), the stormwater of this lot will be controlled on-site by means of building rooftop only.

The stormwater management calculations that follow will detail the extent of on-site SWM control to be implemented and the storage volume required on-site to attain the appropriate runoff release that will conform to the City's established drainage criteria.

Because the site will be connecting to and outletting into the separated Silver Street storm sewer, therefore, the approval exemption under Ontario Regulations 525/98 would apply since storm water discharges from this site will outlet flow into a downstream storm sewer. Thus, an Environmental Compliance Application (ECA) application will not be required to be submitted to the Ministry.

Site Data

1. Development Property Area

Post-Development Site Area Characteristics

Development Lot Area	=	1,579.54 m^2	
Roof Surface Area	=	933.60 m^2	, (C = 0.9)
Concrete/Interlock Area	=	196.26 m^2	, (C = 0.9)
Grass Area	=	352.65 m^2	, (C = 0.2)
Clearstone Area	=	69.74 m^2	, (C = 0.7)
Asphalt Area	=	27.29 m^2	, (C = 0.9)

$$C = \frac{(933.60 \times 0.9) + (196.26 \times 0.9) + (69.74 \times 0.7) + (352.65 \times 0.2) + (27.29 \times 0.9)}{1{,}579.54}$$

$$C = \frac{1{,}160.783}{1{,}579.54}$$

$$C = 0.735$$

Say "C" $= 0.74$

Therefore, the average post-development "C" for this site is 0.74.

2. Controlled Area Data (NODE #1, NODE #2, and NODE #3)

Roof Surface Area	=	933.60 m^2
Total Storm-water Controlled Area	=	933.60 m^2

$$C = \frac{(933.60 \times 0.9)}{933.60}$$

$$C = \frac{840.24}{933.60}$$

$$C = 0.9$$

Say "C" $= 0.9$

Therefore, the post-development "C" for the controlled storm-water drainage area (roof top) is 0.90.

3. Uncontrolled Area Data (NODE #4)

PROPOSED SITE

Asphalt Area	=	27.29 m^2	, (C = 0.9)
Grass Area	=	352.65 m^2	, (C = 0.2)
Concrete/Interlock Area	=	196.26 m^2	, (C = 0.9)
Clearstone Area	=	69.74 m^2	, (C = 0.7)
Total Storm-water Uncontrolled Area	=	645.94 m^2	

$$\mathrm{C} = \frac{(196.26 \times 0.9) + (352.65 \times 0.2) + (69.74 \times 0.7) + (27.29 \times 0.9)}{645.94}$$

$$\mathrm{C} = \frac{320.543}{645.94}$$

$$\mathrm{C} = 0.496$$

$$\text{Say “C”} = 0.50$$

Therefore, the average post-development “C” for the uncontrolled storm-water drainage area of 645.94 m^2 from this site is 0.50.

The total tributary area consisting of approximately 645.94 square metres will be out-letting off site uncontrolled from the residential apartment building site which is also the surface area draining away from the building and subsequently outletting by surface flow to the Summerville Avenue and Silver Street road right of way.

The uncontrolled drainage area draining to the front of the lot is 645.94 m^2 and the controlled drainage area from the available flat roof top is 933.60 m^2 which totals to 1,579.54 m^2.

The SWM area to be controlled is 967.12 m^2. Refer to the attached “Drainage Area Plan” in Figure 1 of **Appendix B** for further details.

Pre-Development Flow Estimation

Maximum allowable off-site flow: two (2)-year storm

Node #101

Pre-Development Site Area Characteristics

Development Lot Area	=	1,579.54 m^2	
Asphalt Area	=	83.67 m^2	, (C = 0.9)
Concrete Area	=	62.13 m^2	, (C = 0.9)
Roof Area	=	277.12 m^2	, (C = 0.9)
Grass Area	=	1,156.62 m^2	, (C = 0.25)

$$C_{2pre} = \frac{(277.12 \times 0.9) + (62.13 \times 0.9) + (83.67 \times 0.9) + (1{,}156.62 \times 0.25)}{1{,}579.54}$$

$$C_{2pre} = \frac{669.783}{1{,}579.54}$$

$$C_{2pre} = 0.424$$

Say $C_{2pre} = 0.43$

Use C_{allow} = 0.43 allowable for redevelopment

T_c = D/V where D = 60.0 m, ΔH = 3.0 m, S = 5.0%, and V = 1.7 feet/second = 0.52 m/s
Therefore,

$$T_c = \frac{60.0\text{ m}}{0.52\text{m/s}}$$

T_c = 1.92 minutes
Use T_c = 10 minutes
I_2 = 77.10 mm/hr [City of Ottawa, two (2)-year storm]

Using the Rational Method

Q_{2pre} = 2.78 (0.43) (77.10) (0.158)

Q_{2pre} = 14.56 L/s

Therefore, the total allowable flow off-site is 14.56 L/s.

The pre-development flow of the two (2)-year and up to the 100-year storm event are draining away from the proposed apartment building and outletting to the Silver Street and Summerville Avenue road right of way are as follows:

Where, Tc = 10 min.

$$Q_{2pre} = 2.78\text{ CIA}$$

$$C_{2pre} = \frac{669.783}{1{,}579.54}$$

$$C_{2pre} = 0.424$$

$$Q_{2pre} = 2.78\ (0.43)\ (77.10)\ (0.158)$$

$$= 14.56\text{ L/s}$$

$$C_{100pre} = \frac{(277.12 \times 1.0)+(62.13 \times 1.0)+(83.67 \times 1.0)+(1{,}156.62 \times 0.25 \times 1.25)}{1{,}579.54}$$

$$C_{100pre} = \frac{784.364}{1,579.54}$$

$$C_{100pre} = 0.4966$$

Say, $C_{100pre} = 0.50$ all draining to the City road right of way at Summerville Ave. and Silver Street

$$Q_{100pre} = 2.78\ (0.50)\ (178.6)\ (0.158)$$

$$= 39.22\ \text{L/s}$$

Therefore under current site conditions the 2 year pre-development flow is estimated at 14.56 L/s and the 100 year pre-development flow is estimated at 39.22 L/s.

A coloured Google image and aerial photography of these current pre-development conditions of the site is provided in **Appendix C** of this report for reference.

Post-Development Flow Estimation

Uncontrolled Drainage Areas

The post-development flow of the two (2)-year and up to the 100-year storm event all draining to the existing road right of way uncontrolled is as follows:

Where, Tc = 10 min.

Node #4

Q_{2post} = 2.78 CIA

Post Development Area Draining to the City road right of way uncontrolled is:

Asphalt Area	=	27.29 m^2	, (C = 0.9)
Concrete/Interlock Area	=	196.26 m^2	, (C = 0.9)
Grass Area	=	352.65 m^2	, (C = 0.2)
Clearstone Area	=	69.74 m^2	, (C = 0.7)

A_{Total} = 645.94 m^2

$$C_{2post} = \frac{(69.74 \times 0.7) + (352.65 \times 0.2) + (196.26 \times 0.9) + (27.29 \times 0.9)}{645.94}$$

$$C_{2post} = \frac{320.543}{645.94}$$

$$C_{2post} = 0.496$$

Say, $C_{2post} = 0.50$ draining to the City of Ottawa road right of way uncontrolled.

$$Q_{2post} = 2.78\ (0.50)\ (77.10)\ (0.0646)$$

$= 6.92\ \text{L/s}$

$$C_{100post} = \frac{(69.74 \times 1.0) + (352.65 \times 0.2 \times 1.25) + (196.26 \times 1.0) + (27.29 \times 1.0)}{645.94}$$

$$C_{100post} = \frac{381.453}{645.94}$$

$$C_{100post} = 0.5905$$

Say, $C_{100post} = 0.59$ draining to the City of Ottawa road right of way uncontrolled

$$Q_{100post} = 2.78\ (0.59)\ (178.6)\ (0.0646)$$

$$= 18.92\ \text{L/s}$$

Therefore under post development condition, the 2 year uncontrolled flow off-site is estimated at 6.92 L/s and the 100 year uncontrolled flow is 18.92 L/s.

For this site, because 645.94 square meters of the site area is drained uncontrolled off site, the net allowable discharge for this site into the existing sewer system using the two (2)-year storm event criteria at C_{pre} = 0.43 is calculated as follow: ($Q_{NetAllow}$ = $Q_{2pre(site)}$ – $Q_{100post(uncontrolled)}$) Q = {2.78 (0.43) (77.10) (0.158) – [2.78 (0.59) (178.6) (0.0646)]} = 14.56 L/s – 18.92 L/s = -4.36 L/s. Therefore, according to this approach, the new allowable controlled flow rate off-site is -4.36 L/s.

Storm-Water Management Analysis

Based on the above calculation from site information provided and given the small area size of the lot under consideration (1,579.54 m^2) an assessment of the 2-Year and 100-Year pre and post development flow will be carried out at this site with implementation of on-site stormwater management (SWM) control by use of flat rooftop storage and controlled roof drains.

For this proposed development, the building flat roof top will be used to provide Stormwater Management (SWM) attenuation for this site. Three (3) controlled roof drains are proposed to regulate flow off-site for on-site SWM measures to be incorporated with this proposed development.

The roof drain maximum flow rate proposed is set at 0.95 L/s (15.0 U.S. gal/min.) for Roof Drain #1, for Roof Drain #2 and for Roof Drain #3 under a head of 150mm at the drain. Therefore, the total controlled roof drain flow off-site is 2.85 L/s (45.0 U.S. gal/min.). The selected roof drains shall conform to Ontario Building Code Section 7.4.10.4. A roof drain controlled letter will be issued to the City by the owner’s mechanical/structural engineers prior to site plan approval.

Thus for this site, the 2 year maximum post development flow rate draining off-site is the uncontrolled flow from the lot plus controlled rooftop flow which equals to 9.77 L/s (6.92 L/s + 2.85 L/s) which is less than the 2-Year pre-development flow of 14.56 L/s for the site. During the 100 year event, the maximum post development flow rate off-site is estimated at 21.77 L/s (18.92 L/s + 2.85 L/s) which is also less than the 100-Year pre-development flow of 39.22 L/s.

Therefore for this proposed development site, the total two (2) year post development release rate of 9.77 L/s is less than the 2-year pre development flow of 14.56 L/s.

For storm events up to and including the 100 year event the total 100-Year post development release rate of 21.77 L/s is less than the 100-Year pre-development flow of 39.22 L/s.

In comparing the pre and post development of the 2-Year and up to the 100-Year storm event and implementation of controlled roof drains on flat rooftop of the building, we can see that the proposed development with SWM measure has improved the current site stormwater flow condition.

To the controlled drainage area (flat roof top of proposed building) the post-development inflow rate during the five (5)-year and 100-year storms for the (3) three flat rooftop areas can be calculated as follows.

Design Discharge Computation

Flat Rooftop Areas

To Calculate Roof Storage Requirements

The proposed flat roof of the apartment building on the property will incorporate three (3) roof drains to control flow off-site for this development property. The roof drain selected has a maximum flow rate of 0.95 L/s (15.0 U.S. gal./min.) under the head of 150mm at the drain for roof drain #1, for roof drain #2 and for roof drain #3 for storm events up to the 100-Year level. The specified roof drain is the Watts "Adjustable Accutrol Weir" (Model # RD-100-A-ADJ) with weir opening in the ¼ open position, which will allow a flow of 0.79 L/s under a head of 100mm water above the drain for each of roof drain #1, roof drain #2 and roof drain #3 for storm events up to the 2-Year level. See Watts "Adjustable Accutrol Weir" in **Appendix D** for further details. Therefore, the maximum stormwater flow to be controlled from this building's rooftop and outletted off site onto the existing Summerville Avenue city storm sewer is (0.95 L/s x 3) = 2.85 L/s. Refer to the Proposed Rooftop Stormwater Management Plan Dwg. 821-10 SWM-1 for roof drain details.

C = 0.9 will be used for sizing roof storage volume in this case.

Inflow rate (Q_A) = 2.78 CIA, where C = 0.9, A = surface area of roof, I = mm/hr

<u>For Roof Area 1, Q_{A1} = 2.78 CIA (NODE #1)</u>

Two (2)-Year Event
C_2 = 0.90
A = 282.02 m^2
I = mm/hr

Q_1 = 2.78 (0.90) (0.0282 ha.) I = 0.0706 I

100-Year Event
$C_{100} = 1.0$
$A = 282.02\ m^2$
I = mm/hr

$Q_1 = 2.78\ (1.0)\ (0.0282\ ha.)\ I = 0.0784\ I$

<u>For Roof Area 2, Q = 2.78 CIA (NODE #2)</u>

Two (2)-Year Event
$C_2 = 0.90$
$A = 262.39\ m^2$
I = mm/hr

$Q_2 = 2.78\ (0.90)\ (0.0262\ ha.)\ I = 0.0656\ I$

100-Year Event
$C_{100} = 1.0$
$A = 262.39\ m^2$
I = mm/hr

$Q_2 = 2.78\ (1.0)\ (0.0262\ ha.)\ I = 0.0728\ I$

<u>For Roof Area 3, Q = 2.78 CIA (NODE #3)</u>

Two (2)-Year Event
$C_2 = 0.90$
$A = 389.19\ m^2$
I = mm/hr

$Q_3 = 2.78\ (0.90)\ (0.0389\ ha.)\ I = 0.0973\ I$

100-Year Event
$C_{100} = 1.0$
$A = 389.19\ m^2$
I = mm/hr

$Q_3 = 2.78\ (1.0)\ (0.0389\ ha.)\ I = 0.1081\ I$

The summary results of the calculated inflow and the storage volume of the site and building's flat rooftop to store the five (5)-year and 100-year storm events are shown in **Tables 1 to 6** inclusive. Refer to **Appendix E** for details.

Table 10 summarizes the post-development design flows from the building roof top area as well as the type of roof drains, the maximum anticipated ponding depths, storage volumes required, and storage volumes provided for the two (2)-year and 100-year design events.

Table 10: Design Flow and Roof Drain Table

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)		Approximate Ponding Depth Above Drains (m)		Storage Volume Required (m^3)		Max. Storage Available (m^3)
			2 YR	100 YR	2 YR	100 YR	2 YR	100 YR	
RD-1 (0.0282 ha)	1	RD-100-A-ADJ (1/4 OPENING EXPOSED)	0.79	0.95	0.10	0.15	3.70	12.42	13.85
RD-2 (0.0262 ha)	1	RD-100-A-ADJ (1/4 OPENING EXPOSED)	0.79	0.95	0.10	0.15	3.32	11.26	12.95
RD-3 (0.0389 ha)	1	RD-100-A-ADJ (1/4 OPENING EXPOSED)	0.79	0.95	0.10	0.15	5.82	18.90	19.62
Total Roof (0.0933 ha)	**3**	-	**2.37**	**2.85**	-	-	**12.84**	**42.58**	**46.42**

Water Quality

For this proposed development site, the local conservation authority (RVCA) was pre-consulted regarding the issue of water quality treatment on-site.

On July 14, 2021, RVCA confirmed that for this site of ±0.1115ha (±1,114.81 m^2) no water quality controls are required based on the current development proposal. Best management practices are encouraged to be implemented, where possible (Refer to RVCA's review comments in **Appendix F**).

Erosion and Sediment Control

The contractor shall implement Best Management Practices to provide for protection of the receiving storm sewer during construction activities. These practices are required to ensure no sediment and/or associated pollutants are released to the receiving watercourse. These practices include installation of a City approved "siltsack" or equivalent catch basin sediment control device or equal in catch basins as recommended by manufacturer on-site and off-site within the Silver Street and Summerville Avenue road right of way adjacent to this property. Siltsack shall be inspected every 2 to 3 weeks and after every major storm. The deposits will be disposed of as per the requirements of the contract. See Dwg. #821-10 ESC-1 for details.

Conclusion

In assessing the 2-Year storm event up to the 100-Year storm events under pre-development conditions to that of the same storm events under post-development conditions with implementation of the proposed on-site SWM measures (flat rooftop storage with (3) specified controlled drains) it was determined that post-development release rates has been improved for the site compared with the current existing flow rates.

The pre-development flow at the 2-Year storm event is 14.56 L/s and 39.22 L/s for the 100-Year event. By incorporating the proposed SWM attenuation measures the post-development 2-Year flow is estimated at 9.77 L/s and the 100-Year flow is estimated at 21.77 L/s.

Therefore for this proposed development site, the two (2) year post development release rate of 9.77 L/s is less than the 2-Year pre-development flow rate of 14.56 L/s. For storm events up to and including the 100-Year event, the total 100-Year post-development release rate of 21.77 L/s is less than the 100-Year pre-development flow of 39.22 L/s.

At this proposed residential site and to develop this site to house a 32 unit apartment building on a 0.158 ha. parcel of land, on-site SWM attenuation will be incorporated by means of the flat rooftop storage at the proposed apartment building. Three (3) controlled roof drains are incorporated and each drainage controlled to a release rate of 0.95 L/s (15.0 U.S. gal/min.). The maximum controlled flow from this site (3 roof drains at 0.95 L/s per drain) totals to 2.85 L/s for the post development condition.

During the two (2)-year storm event for the flat rooftop storage, the ponding depth of rooftop area 1, 2 and 3 is estimated at 100mm at the drain and 0mm at the roof perimeter, assuming a 1.1% minimum roof pitch to the drain and controlling the flow rate at 0.79 L/s per drain. The rooftop storage available at Roof Area 1 is 4.17 m^3, rooftop storage available at Roof Area 2 is 3.81 m^3 and the rooftop storage available at Roof Area 3 is 6.12 m^3, for a total of 14.10 m^3, which is greater than the required volume of 12.84 m^3.

During the 100-year storm event for the flat rooftop storage, the ponding depth of Roof Area 1, 2 and 3 is estimated at 150 mm at the drain and 0mm at the roof perimeter, assuming a 1.1% minimum roof pitch to the drain and controlling the flow rate at 0.95 L/s per drain. The rooftop storage available at Roof Area 1 is 13.85 m^3, rooftop storage available at Roof Area 2 is 12.95 m^3 and the rooftop storage available at Roof Area 3 is 19.62 m^3, for a total of 46.42 m^3, which is greater than the required volume of 42.58 m^3.

Therefore, by means of flat building rooftop storage and grading the site to the proposed grades as shown on the Proposed Grading and Servicing Plan and Proposed Rooftop Stormwater Management Plan Dwg. 821-10 G-1 and 821-10 SWM-1 respectively, the desirable two (2)-year storm and 100-year storm event detention volume of 14.10 m^3 and 46.42 m^3 respectively will be available on site. Refer to **Appendix E** for detailed calculations of available storage volumes.

The building weeping tile drainage will outlet via its separate 150mm diameter PVC storm lateral. The roof drains will be outletted also via a separate 150mm PVC storm lateral which "wye" into the proposed 150mm dia. weeping tile storm lateral, where upon both laterals are outletting to the existing Summerville Avenue 300mm diameter storm sewer with only one (1) connection. The City of Ottawa recommends that pressurized drain pipe material be used in the building for the roof drain leader pipe in the event of surcharging in the City Storm sewer system. Refer to the proposed site grading and servicing plan Dwg. 821-10 G-1 for details.

PREPARED BY T.L. MAK ENGINEERING CONSULTANTS LTD.

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LICENSED PROFESSIONAL ENGINEER
02/24/23
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PROVINCE OF ONTARIO

PROPOSED THREE STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 31

R-PLAN 294

1058, 1062 AND 1066 SILVER STREET

CITY OF OTTAWA

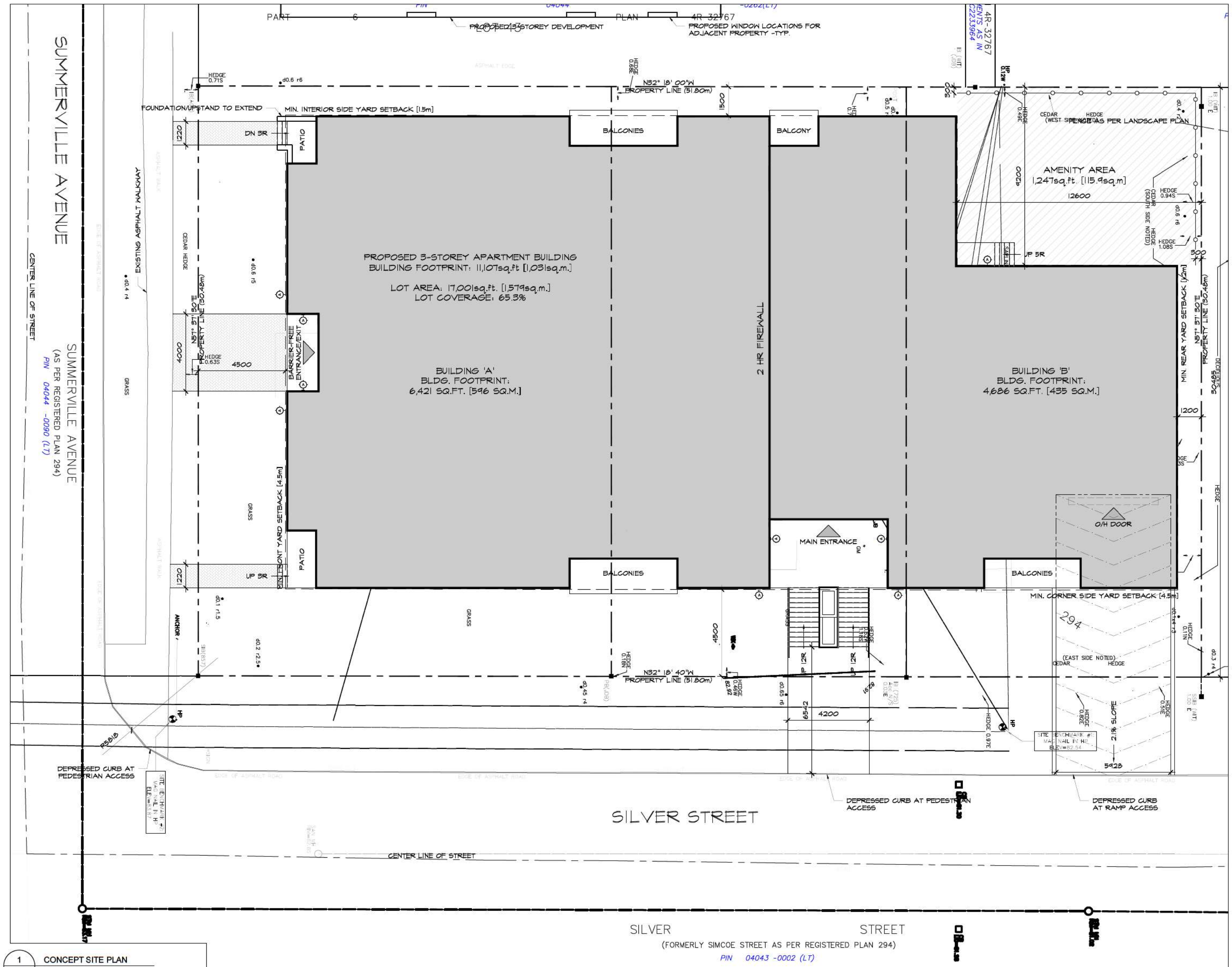
APPENDIX A

SITE PLAN

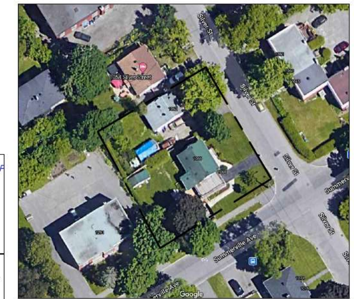
DWG. No. A1.0

LEGEND

- O/H — NEW OVERHEAD DOOR
- NEW DOOR / ENTRANCE
- PROPOSED RIVERSTONE MULCH
- 0.3α — EXISTING VEGETATION REFER TO LANDSCAPE DWGS
- BICYCLE PARKING SPACE (1.8Mx0.6M)
- NO PARKING LINES
- PROPOSED PRECAST CONCRETE PAVERS
- PROPOSED SOD - REFER TO LANDSCAPE DWGS
- NEW SAWCUT CONCRETE SIDEWALK
- # — PARKING STALL COUNT PER ROW
- S# — NEW SIGN, REFER TO SIGN LEGEND
- SL — STREET LIGHT
- SL — HYDRO POST
- DESIGNATED ACCESSIBLE PARKING SPACE AS PER AODA STANDARDS
- V VISITOR PARKING
- TWO WAY TRAFFIC
- DEPRESSED CURB (DC)
- PROPERTY LINE
- EXISTING FENCE
- MINIMUM SETBACKS (ZONING)
- NEW CONSTRUCTION
- EXISTING BUILDINGS
- BUILDING MOUNTED LIGHTS REFER TO ELECTRICAL DWGS
- *REFER TO LANDSCAPE DWGS



1 CONCEPT SITE PLAN
A1.0 SCALE 1 : 100



KEY PLAN

BUILDING AREAS

	CONSTRUCTION AREA (SQ.M)	CONSTRUCTION AREA (SQ.FT)
LOWER LEVEL		
GROUND FLOOR LEVEL	1004 sq.m	10,817 sq.ft
SECOND FLOOR LEVEL	1004 sq.m	10,817 sq.ft
THIRD FLOOR LEVEL	949 sq.m	10,215 sq.ft
TOTAL	2,957 sq.m	31,849 sq.ft

BUILDING FLOOR STATISTICS - RENTAL APARTMENT

FLOOR	SUITES	2 BEDROOM	1 BEDROOM + DEN	1 BEDROOM
LOWER LEVEL	-	-	-	-
GROUND FLOOR	10	4	5	1
SECOND FLOOR	11	4	5	2
THIRD FLOOR	11	3	6	2
TOTAL	32	11	16	5
SUITE MIX		35%	50%	15%

CITY OF OTTAWA ZONING BY-LAW

ZONING PROVISIONS	REQUIRED	PROPOSED
R4UC		
MIN. LOT AREA	450 sq.m	confirm
MAX. LOT AREA	1070 sq.m	1580 sq.m
MIN. LOT WIDTH	15m	30.5m
MAX. LOT WIDTH	15m	46m
MIN. INTERIOR YARD AREA	9.2m x 12.58m	9.2m x 12.58m
MIN. FRONT YARD SETBACK	4.5m	4.5m
MIN. CORNER SIDE YARD SETBACK 4.5m		4.5m
MIN. INTERIOR SIDE YARD SETBACK 1.5m		1.6m
MIN. REAR YARD SETBACK	1.2m	1.35m
MIN. INTERIOR YARD SETBACK	CONFIRM	CONFIRM
MAX BUILDING HEIGHT	11M	11M
AMENITY AREA	40% OF FRONT YARD, 30% OF LOT AREA, 50% OF REAR YARD	70% OF FRONT YARD, 36.4% OF LOT AREA, 100% OF REAR YARD
LOT COVERAGE	N/A	63.6%

AUTOMOBILE PARKING SUMMARY

REQUIRED PARKING	REQUIRED	PROPOSED
RESIDENT PARKING	0.5/UNIT (AFTER 12) X 20 = 10 SPACES	18
VISITOR PARKING	0.1/UNIT (AFTER 12) X 20 = 2 SPACES	2
TOTAL	12	20

ACCESSIBLE PARKING SUMMARY

		REQUIRED	PROPOSED
REGULAR	MIN. 2.6mx5.2m	11	20
ACCESSIBLE	TYPE B 2.4mx5.2m	1	1
TOTAL		12	21

BICYCLE PARKING SUMMARY

REQUIRED PARKING	REQUIRED	PROPOSED
BIKE PARKING	0.5/UNIT X 32 = 16 SPACES	32

POWER-TEK GROUP

NOTES:

1) ALL WORK TO BE IN COMPLIANCE WITH LOCAL BUILDING CODES, REGULATIONS AND BY-LAWS.

2) ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH PLANS IN CONTRACT DOCUMENTS.

3) DO NOT SCALE DRAWINGS.

4) ALL SUB-CONTRACTORS TO TAKE THEIR OWN ON-MEASUREMENTS AND BE RESPONSIBLE FOR THEIR ACCURACY.

5) NOTIFY SHAWN J. LAWRENCE ARCHITECT FOR ANY ERRORS AND/OR OMISSIONS PRIOR TO START OF WORK.

ONTARIO ASSOCIATION OF ARCHITECTS — LICENCE 4442

NORTH ARROW

No.	DATE	REVISION
08	2022.11.09	RE-ISSUED FOR SPC
07	2022.05.11	ISSUED FOR COORDINATION
06	2022.03.30	RE-ISSUED FOR SPC
05	2022.03.25	ISSUED FOR SPC
04	2022.03.16	ISSUED FOR COORDINATION
03	2022.03.10	ISSUED FOR COORDINATION
02	2021.06.08	ISSUED FOR REVIEW
01	2021.05.27	ISSUED FOR REVIEW

S.J.LAWRENCE ARCHITECT INCORPORATED
18 DEAKIN STREET
SUITE 205
OTTAWA, ONTARIO
K2E 8B7
T: (613) 739.7770
F: (613) 739.7703
sjl@sjlarchitect.com

PROJECT: SILVER STREET DEVELOPMENT
1062 & 1066 SILVER STREET, OTTAWA ON

SHEET TITLE: SITE PLAN

DRAWN BY: R.R. CHECKED BY: B.L.

PLOT DATE: 2022-11-09 1:56:46 PM

JOB NUMBER: SL-1046-21 SCALE: As indicated

A1.0

PLAN # 18545

APPLICATION # D07-12-21-0112

PROPOSED THREE STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 31

R-PLAN 294

1058, 1062 AND 1066 SILVER STREET

CITY OF OTTAWA

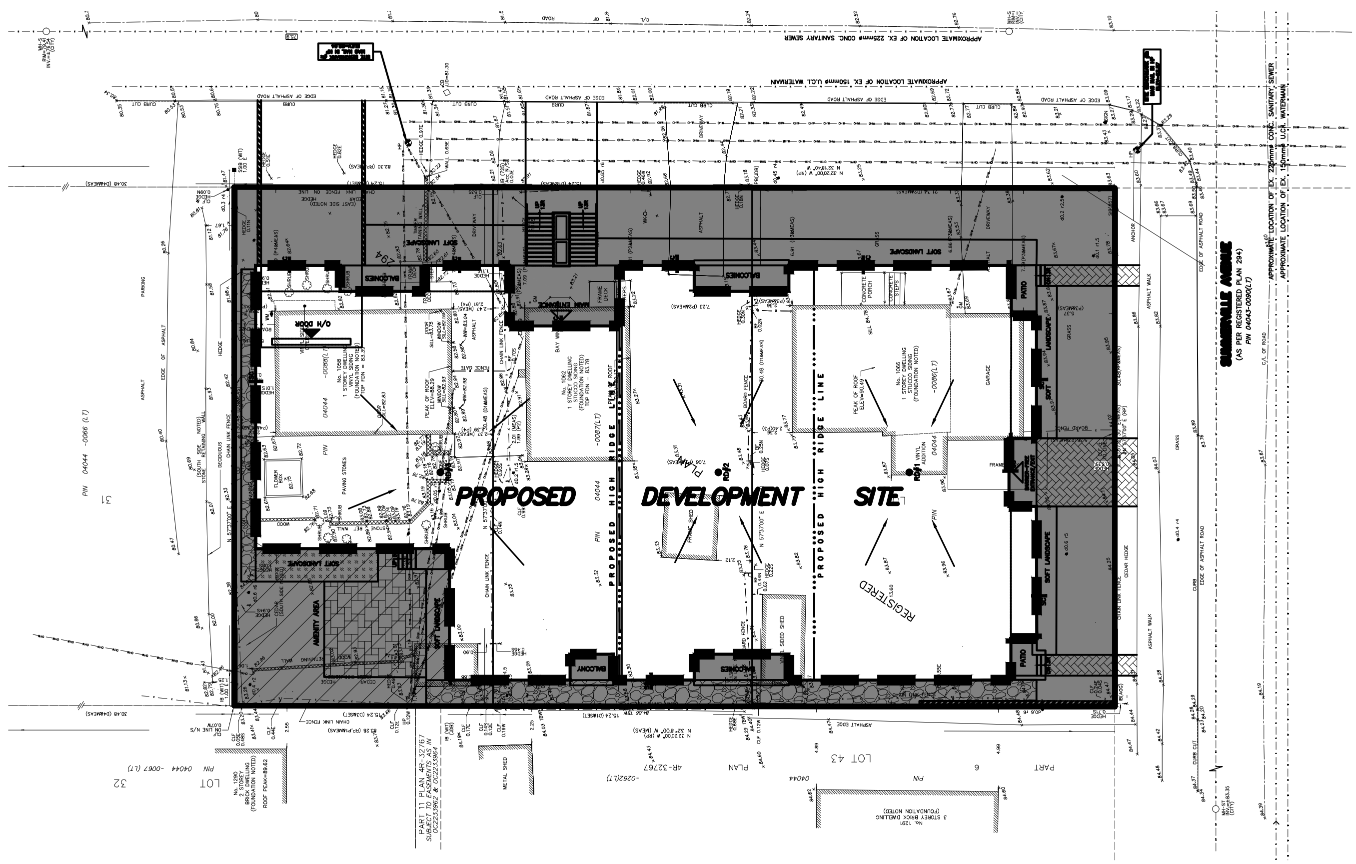
APPENDIX B

STORM DRAINAGE AREA PLAN

FIGURE 1

PROPOSED 1058, 1062 & 1066 SILVER STREET
SITE DEVELOPMENT
DRAINAGE AREA PLAN

N.T.S.



LEGEND

LIMIT OF CONTROLLED STORM DRAINAGE AREA = 933.60 SQ. M

UNCONTROLLED STORM DRAINAGE AREA = 645.94 SQ. M

TOTAL AREA = 1,579.54 SQ. M

POST-DEVELOPMENT SITE AVERAGE "C" = 0.74

T.L. MAK ENGINEERING CONSULTANTS LTD.
CONSULTING ENGINEERS

PROJECT No.	DATE	DRAWING No.
821-10	FEBRUARY 2023	FIGURE 1

PROPOSED THREE STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 31

R-PLAN 294

1058, 1062 AND 1066 SILVER STREET

CITY OF OTTAWA

APPENDIX C

SITE PRE-DEVELOPMENT CONDITION

GOOGLE IMAGE 2019

AND

AERIAL PHOTOGRAPHY 2019 (GEOOTTAWA)


PROPOSED DEVELOPMENT SITE
rue Silver St.
av. Summerville Ave.
1058
1062
1066
1280
1281
1276
1290
1291
1295
1305
1294
1074
1061
1063
1065
1269
1271
1267
1265

2019


1281
1270
1276
1265
1280
1267
rue Silver St.
1061
1063
1269
Ave.
1058
1271
1065
1062
1290
av.
PROPOSED
DEVELOPMENT
SITE
1066
1291
1295
av. Summerville Ave.
rue Silver St.
1305
1074
1294

2019

2019

2019

2019

2019

PROPOSED THREE STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 31

R-PLAN 294

1058, 1062 AND 1066 SILVER STREET

CITY OF OTTAWA

APPENDIX D

PROPOSED ROOF DRAIN

DETAILS

WATTS®	Adjustable Accutrol Weir Tag: ____________	Adjustable Flow Control for Roof Drains

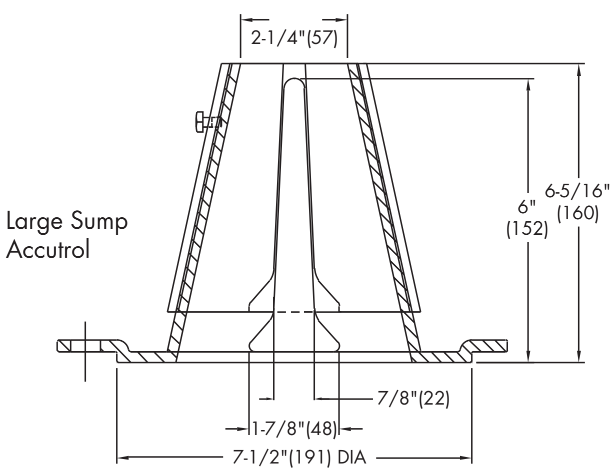
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

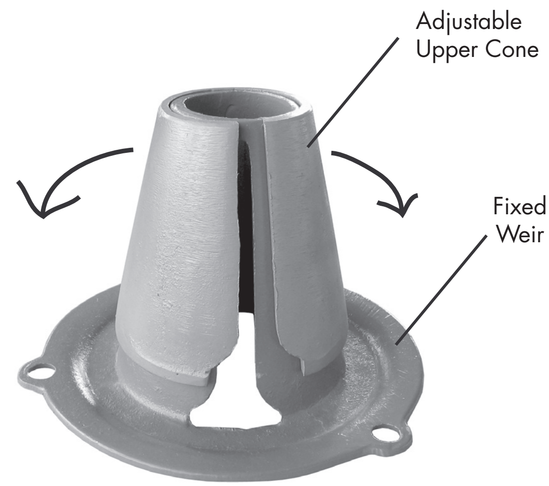
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2"of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3"of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
[5 gpm (per inch of head) x 2 inches of head] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	5	5	5	5	5

Job Name ____________ Contractor ____________

Job Location ____________ Contractor's P.O. No. ____________

Engineer ____________ Representative ____________

WATTS®
A Watts Water Technologies Company

USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com

PROPOSED THREE STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 31

R-PLAN 294

1058, 1062 AND 1066 SILVER STREET

CITY OF OTTAWA

APPENDIX E

TABLES 1 TO 6 INCLUSIVE

DETAILED CALCULATIONS

FOR TW0 (2)-YEAR AND 100-YEAR

AVAILABLE STORAGE VOLUME

PROPOSED 1058, 1062 AND 1066 SILVER STREET THREE STOREY

APARTMENT BUILDING DEVELOPMENT SITE

TABLE 1

TWO (2)-YEAR EVENT

REQUIRED BUILDING ROOF AREA 1 STORAGE VOLUME (NODE #1)

t_c **TIME** (minutes)	**I** **2-YEAR** (mm/hr)	**Q** **ACTUAL** (L/s)	**Q** **ALLOW** (L/s)	**Q** **STORED** (L/s)	**VOLUME** **STORED** (m^3)
5	102.80	7.26	0.79	6.47	1.94
10	77.10	5.44	0.79	4.65	2.79
15	63.30	4.47	0.79	3.68	3.31
20	52.03	3.67	0.79	2.88	3.46
25	45.17	3.19	0.79	2.40	3.60
30	40.04	2.83	0.79	2.04	3.67
35	36.06	2.55	0.79	1.76	<u>3.70</u>
40	32.86	2.32	0.79	1.53	3.67
45	30.24	2.14	0.79	1.35	3.65
50	28.04	1.98	0.79	1.19	3.57
55	26.17	1.85	0.79	1.06	3.50

Therefore, the required rooftop storage volume is 3.70 m^3.

PROPOSED 1058, 1062 AND 1066 SILVER STREET THREE STOREY

APARTMENT BUILDING DEVELOPMENT SITE

TABLE 2

TWO (2)-YEAR EVENT

REQUIRED BUILDING ROOF AREA 2 STORAGE VOLUME (NODE #2)

t_c **TIME** (minutes)	**I** **2-YEAR** (mm/hr)	**Q** **ACTUAL** (L/s)	**Q** **ALLOW** (L/s)	**Q** **STORED** (L/s)	**VOLUME** **STORED** (m^3)
5	102.80	6.74	0.79	5.95	1.79
10	77.10	5.06	0.79	4.27	2.56
15	63.30	4.15	0.79	3.36	3.02
20	52.03	3.41	0.79	2.62	3.14
25	45.17	2.96	0.79	2.17	3.26
30	40.04	2.63	0.79	1.84	3.31
35	36.06	2.37	0.79	1.58	3.32
40	32.86	2.16	0.79	1.37	3.29
45	30.24	1.98	0.79	1.19	3.21
50	28.04	1.84	0.79	1.05	3.15
55	26.14	1.72	0.79	0.93	3.07

Therefore, the required rooftop storage volume is 3.32 m^3.

PROPOSED 1058, 1062 AND 1066 SILVER STREET THREE STOREY

APARTMENT BUILDING DEVELOPMENT SITE

TABLE 3

TWO (2)-YEAR EVENT

REQUIRED BUILDING ROOF AREA 3 STORAGE VOLUME (NODE #3)

t_c **TIME** (minutes)	**I** **2-YEAR** (mm/hr)	**Q** **ACTUAL** (L/s)	**Q** **ALLOW** (L/s)	**Q** **STORED** (L/s)	**VOLUME** **STORED** (m^3)
5	102.80	10.00	0.79	9.21	2.76
10	77.10	7.50	0.79	6.71	4.03
15	63.30	6.16	0.79	5.37	4.83
20	52.03	5.06	0.79	4.27	5.12
25	45.15	4.39	0.79	3.60	5.40
30	40.04	3.90	0.79	3.11	5.60
35	36.06	3.51	0.79	2.72	5.71
40	32.86	3.20	0.79	2.41	5.78
45	30.24	2.94	0.79	2.15	5.81
50	28.04	2.73	0.79	1.94	5.82
55	26.14	2.54	0.79	1.75	5.78

Therefore, the required rooftop storage volume is 5.82 m^3.

PROPOSED 1058, 1062 AND 1066 SILVER STREET THREE STOREY

APARTMENT BUILDING DEVELOPMENT SITE

TABLE 4

100-YEAR EVENT

REQUIRED BUILDING ROOF AREA 1 STORAGE VOLUME (NODE #1)

t_c **TIME** (minutes)	**I** **100-YEAR** (mm/hr)	**Q** **ACTUAL** (L/s)	**Q** **ALLOW** (L/s)	**Q** **STORED** (L/s)	**VOLUME** **STORED** (m^3)
10	178.6	14.00	0.95	13.05	7.83
15	142.9	11.20	0.95	10.25	9.23
20	120.0	9.41	0.95	8.46	10.15
25	103.9	8.15	0.95	7.20	10.80
30	91.9	7.21	0.95	6.26	11.27
35	82.6	6.48	0.95	5.53	11.61
40	75.1	5.89	0.95	4.94	11.86
45	69.1	5.42	0.95	4.47	12.07
50	63.9	5.01	0.95	4.06	12.18
55	59.6	4.67	0.95	3.72	12.28
60	55.9	4.38	0.95	3.43	12.35
65	52.6	4.12	0.95	3.17	12.36
70	49.8	3.90	0.95	2.95	12.39
75	47.26	3.705	0.95	2.76	<u>12.42</u>
80	45.0	3.53	0.95	2.58	12.38
85	42.95	3.37	0.95	2.42	12.34
90	41.1	3.22	0.95	2.27	12.26

Therefore, the required storage volume is 12.42 m^3.

PROPOSED 1058, 1062 AND 1066 SILVER STREET THREE STOREY

APARTMENT BUILDING DEVELOPMENT SITE

TABLE 5

100-YEAR EVENT

REQUIRED BUILDING ROOF AREA 2 STORAGE VOLUME (NODE #2)

t_c **TIME** (minutes)	**I** **100-YEAR** (mm/hr)	**Q** **ACTUAL** (L/s)	**Q** **ALLOW** (L/s)	**Q** **STORED** (L/s)	**VOLUME** **STORED** (m^3)
10	178.6	13.00	0.95	12.05	7.23
15	142.9	10.40	0.95	9.45	8.51
20	120.0	8.74	0.95	7.79	9.35
25	103.9	7.56	0.95	6.61	9.92
30	91.9	6.69	0.95	5.74	10.33
35	82.6	6.01	0.95	5.06	10.63
40	75.1	5.47	0.95	4.52	10.85
45	69.1	5.03	0.95	4.08	11.02
50	63.9	4.65	0.95	3.70	11.10
55	59.6	4.34	0.95	3.39	11.19
60	55.9	4.07	0.95	3.12	11.23
65	52.6	3.83	0.95	2.88	11.232
70	49.8	3.63	0.95	2.68	<u>11.26</u>
75	47.26	3.44	0.95	2.49	11.21
80	45.0	3.28	0.95	2.33	11.18
85	42.95	3.13	0.95	2.18	11.12
90	41.1	2.99	0.95	2.04	11.02

Therefore, the required rooftop storage volume is 11.26 m^3.

PROPOSED 1058, 1062 AND 1066 SILVER STREET THREE STOREY

APARTMENT BUILDING DEVELOPMENT SITE

TABLE 6

100-YEAR EVENT

REQUIRED BUILDING ROOF AREA 3 STORAGE VOLUME (NODE #3)

t_c **TIME** (minutes)	**I** **100-YEAR** (mm/hr)	**Q** **ACTUAL** (L/s)	**Q** **ALLOW** (L/s)	**Q** **STORED** (L/s)	**VOLUME** **STORED** (m^3)
10	178.6	19.31	0.95	18.36	11.02
15	142.9	15.45	0.95	14.50	13.05
20	120.0	12.97	0.95	12.02	14.42
25	103.9	11.23	0.95	10.28	15.42
30	91.9	9.93	0.95	8.98	16.16
35	82.6	8.93	0.95	7.98	16.76
40	75.1	8.12	0.95	7.17	17.21
45	69.1	7.47	0.95	6.52	17.60
50	63.9	6.91	0.95	5.96	17.88
55	59.6	6.44	0.95	5.49	18.12
60	55.90	6.04	0.95	5.09	18.32
65	52.6	5.69	0.95	4.74	18.49
70	49.8	5.38	0.95	4.43	18.61
75	47.26	5.11	0.95	4.16	18.72
80	45.0	4.87	0.95	3.92	18.82
85	42.95	4.64	0.95	3.69	18.819
90	41.10	4.44	0.95	3.49	18.85
95	39.44	4.26	0.95	3.31	18.87
100	37.90	4.10	0.95	3.15	18.90
105	36.50	3.95	0.95	3.00	<u>18.90</u>
110	35.20	3.81	0.95	2.86	18.88
115	34.01	3.68	0.95	2.73	18.84

Therefore, the required rooftop storage volume is 18.90 m^3.

AVAILABLE STORAGE VOLUME CALCULATIONS

Two (2)-Year Event

Roof Storage at Flat Roof Building

The flat Roof Area 1, Roof Area 2 and Roof Area 3 will be used for storm-water detention. Each roof area will be drained by a controlled drain designed for a release rate of 12.50 U.S. gal./min. or 0.79 L/s at a height of 100mm above the drain. Refer to Dwg. 821-10 SWM-1 for roof drain details.

Roof Storage Area 1 (NODE No. 1)

Available flat roof area for storage = 282.20 m^2, C = 0.9, @ roof slope of 1.1% minimum or 100mm of water height above the roof drain. Therefore, the available roof area will store a volume as shown below using the reservoir volume equation.

$$V = \frac{(0.10\text{m})[126.60 + 4(30.87) + 0]}{6}$$

$$V = \frac{(0.10)(250.08)}{6}$$

$$V = 4.17\ \text{m}^3$$

The available Roof Area 1 storage volume of 4.17 m^3 > required two (2)-year storage volume of 3.70 m^3 from Table 1.

Roof Storage Area 2 (NODE No.2)

Available flat roof area for storage = 262.39 m^2, C = 0.9, @ roof slope of 1.1% minimum or 100mm of water height above the roof drain. Therefore, the available roof area will store a volume as shown below using the reservoir volume equation.

$$V = \frac{(0.10\text{m})[114.58 + 4(28.43) + 0]}{6}$$

$$V = \frac{(0.10)(228.30)}{6}$$

$$V = 3.81\ \text{m}^3$$

The available Roof Area 2 storage volume of 3.81 m^3 > required two (2)-year storage volume of 3.32 m^3 from Table 2.

Roof Storage Area 3 (NODE No.3)

Available flat roof area for storage = 389.19 m^2, C = 0.9, @ roof slope of 1.1% minimum or 100mm of water height above the roof drain. Therefore, the available roof area will store a volume as shown below using the reservoir volume equation.

$$V = \frac{(0.10\text{m})[198.39 + 4(42.26) + 0]}{6}$$

$$V = \frac{(0.10)(367.43)}{6}$$

$$V = 6.12\ \text{m}^3$$

The available Roof Area 3 storage volume of 6.12 m^3 > required two (2)-year storage volume of 5.82 m^3 from Table 3.

Therefore, the ponding depth at the Roof Drain 1, 2 and 3 location is approximately 0.10 m (100 mm), and the two (2)-year level is estimated not to reach the roof perimeter of the building.

Hence, Roof Area 1, Roof Area 2 and Roof Area 3 of the proposed residential building flat rooftop storage are adequate to store the minimum required two (2)-year storm event volume of 12.84 m^3 given it can store up to 14.10 m^3.

AVAILABLE STORAGE VOLUME CALCULATIONS

100-Year Event

Roof Storage at Flat Roof Building

The flat Roof Area 1, Roof Area 2, and Roof Area 3 will be used for storm-water detention. Each roof area will be drained by a controlled drain designed for a release rate of 15.0 U.S. gal./min. or 0.95 L/s at a height of 150mm above the drain. Refer to Dwg. 821-10 SWM-1 for roof drain details.

Roof Storage Area 1 (NODE No. 1)

Available flat roof area for storage = 282.02 m^2, C = 1.0, @ roof slope of 1.1% minimum or 150mm of fall from roof perimeter to roof drain. Therefore, the available roof area will store a volume as shown below using the reservoir volume equation.

$$V = \frac{(0.15\text{m})[282.02 + 4(68.03) + 0]}{6}$$

$$V = \frac{(0.15)(554.14)}{6}$$

$$V = 13.85\ m^3$$

The available Roof Area 1 storage volume of 13.85 m^3 > required 100-year storage volume of 12.42 m^3 from Table 4.

Roof Storage Area 2 (NODE No. 2)

Available flat roof area for storage = 262.39 m^2, C = 1.0, @ roof slope of 1.1% minimum or 150mm of fall from roof perimeter to roof drain. Therefore, the available roof area will store a volume as shown below using the reservoir volume equation.

$$V = \frac{(0.15\text{m})[262.39 + 4(63.94) + 0]}{6}$$

$$V = \frac{(0.15)(518.15)}{6}$$

$$V = 12.95\ m^3$$

The available Roof Area 2 storage volume of 12.95 m^3 > required 100-year storage volume of 11.26 m^3 from Table 5.

Roof Storage Area 3 (NODE No. 3)

Available flat roof area for storage = 389.19 m^2, C = 1.0, @ roof slope of 1.1% minimum or 150mm of fall from roof perimeter to roof drain. Therefore, the available roof area will store a volume as shown below using the reservoir volume equation.

$$V = \frac{(0.15\text{m})[389.19 + 4(98.86) + 0]}{6}$$

$$V = \frac{(0.15)(784.63)}{6}$$

$$V = 19.62\ m^3$$

The available Roof Area 3 storage volume of 19.62 m^3 > required 100-year storage volume of 18.90 m^3 from Table 6.

Hence, Roof Area 1, Roof Area 2 and Roof Area 3 of the proposed residential building flat rooftop storage are adequate to store the minimum required 100-year storm event volume of 42.58 m^3 given it can store up to 46.42 m^3.

Therefore, the ponding depth at the Roof Drain 1, 2 and 3 location is approximately 0.15m (150mm), and at the perimeter of the flat roof area is 0mm above the roof perimeter surface. Accordingly, it is recommended that six (6) roof scuppers as shown on Dwg. 821-10 G-1 and 821-10 SWM-1 and the architect's roof plan be installed at the perimeter height of the rooftop for emergency overflow purposes in case of blockage from debris build up at the roof drain.

PROPOSED THREE STOREY

RESIDENTIAL APARTMENT BUILDING SITE

PART OF LOT 31

R-PLAN 294

1058, 1062 AND 1066 SILVER STREET

CITY OF OTTAWA

APPENDIX F

RIDEAU VALLEY CONSERVATION AUTHORITY

REVIEW COMMENTS

OF

JULY 14, 2021

TL MaK

From: Eric Lalande [eric.lalande@rvca.ca]
Sent: July 14, 2021 10:24 AM
To: TL MaK
Subject: RE: 1066 Silver Street

Hi Tony,

Based on the provided Site plan, the RVCA would require no additional water quality protection be provided on-site.

Thank you,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: TL MaK <tlmakecl@bellnet.ca>
Sent: Monday, July 12, 2021 3:26 PM
To: Eric Lalande <eric.lalande@rvca.ca>
Subject: 1066 Silver Street

Hi Eric,

Presently we are contacting the RVCA for pre-consultation regarding our project at 1066 Silver Street.

Could you please review and let us know whether there are any water quality requirements for the proposed development at 1066 Silver Street. We will be implementing storm water management regarding quantity control as required by the City of Ottawa (by means of flat rooftop SWM attenuation only).

Attached please find the PDFs of our engineering drawings for your review and comments. They are as follows:

1. Proposed Site Grading and Servicing Plan (Dwg. #821-10, G-1 Rev. 1)
2. Landscape Plan (Dwg. No. 121139-L1, Rev. No. 1)
3. Concept Site Plan (Dwg. No. A1.0, Rev. No. 4)

Let us know if you have any questions.

Regards,

Tony Mak

T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON. K1C 6Z7
Tel. 613-837-5516 | Fax: 613-837-5277
E-mail: tlmakecl@bellnet.ca