
MEMORANDUM

DATE: 2020-04-24

EMAIL

TO: City of Ottawa IAD Review Officer

SUBJECT: Proposed Amendment to 36 Robinson Servicing and
Stormwater Management Report
City File Number: D07-12-19-0044

OUR FILE: DSEL Project No.18-1078

ATTACHMENTS:

- Site Plan, SP-1, by Hobin Architecture, Dated April 20, 2020
- Water Demand Calculation Sheet – Post-development, by DSEL, dated July 29, 2019, Previously Approved
- Water Demand Calculation Sheet – Post-development, by DSEL, dated April 2020, Proposed Amendment
- Wastewater Calculation Sheet – Post-development, by DSEL, dated July 29, 2019, Previously Approved
- Wastewater Calculation Sheet – Post-development, by DSEL, dated April 2020, Proposed Amendment
- Storm Calculation Sheet – Post-development Conditions, by DSEL, Dated January 7, 2020, Previously Approved
- Storm Calculation Sheet – Post-development Conditions, by DSEL, Dated April 2020, Proposed Amendment

TCU Development Corporation has provided a revised site plan (**SP-1**) dated April 20, 2020, included at the back of this memo. The updated site plan proposes to amend the previously approved site plan application D07-12-19-0044.

The following memo addresses the impact of the updated site plan on the previously approved functional servicing and stormwater management report dated January 2020. The site plan has been revised with updated unit counts. The revisions of site plan result in a decrease in total apartment units; previously **192 units** with an estimated population of **280** was proposed, the updated plan proposes a total of **153 units** with an estimated population of **272**.

As a result, the previously approved water demand will be lowered by **3%** as shown by the attached water demand calculation sheet. Based on previous City of Ottawa boundary conditions, adequate water supply is available within the municipal watermain system to support the

proposed development within the acceptable pressure range. A pressure check should be conducted at the completion of construction to determine if pressure control is required.

Table 1, below, summarizes the anticipated water supply demand and boundary conditions for the proposed development based on the **Water Supply Guidelines**.

Table 1 – Proposed Condition Water Demands

Design Parameter	Anticipated Demand ¹ (L/min) (Previously Approved)	Anticipated Demand ¹ (L/min) (Proposed Amendment)	Boundary Condition ² (m H ₂ O / kPa)
Average Daily Demand	54.4	52.9	55.1 / 540.5
Max Day + Fire Flow	196.0 + 6,650 = 6,846.0	190.4 + 6,650 = 6,840.4	11,400 L/min @ 20 psi / 140 kPa
Peak Hour	294.0	285.6	45.6 / 447.3
1) Water demand calculation per Water Supply Guidelines . See Appendix B for detailed calculations. 2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation for fire flow is 59.6m. See Appendix B .			

Similarly, the anticipated sanitary flows as previously approved will decrease by **3%** as a result of the updated site plan as shown by the attached wastewater calculation sheet; as a result of the reduction, no change is proposed to the previously approved sanitary service. **Table 2**, below, demonstrates the anticipated peak flows from the proposed development.

Table 2 – Proposed Condition Wastewater Flows

Design Parameter	Proposed Flow (L/s) (Previously Approved)	Proposed Flow (L/s) (Proposed Amendment)
Estimated Average Dry Weather Flow	0.92	0.89
Estimated Peak Dry Weather Flow	3.20	3.12
Estimated Peak Wet Weather Flow	3.33	3.24

Table 3 summarizes the previously approved release rates and onsite storage required to meet established target release rates from the existing approved stormwater management plan. The previous established allowable combined release rate was **16.27 L/s** and the allowable stormwater release rate was equal to **13.07 L/s**. ($16.27 - 3.20 = 13.07$ L/s).

Table 3 - Previously Approved SWM Summary

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m ³)	100-Year Release Rate (L/s)	100-Year Storage (m ³)
Unattenuated Areas	3.16	0.00	6.77	0.00
Foundation Drainage	1.04	0.00	1.04	0.00
Attenuated Areas	2.73	33.46	5.26	64.46
Total	6.93	33.46	13.07	64.46

The attached storm calculation sheets illustrate the previously approved plan and proposed amendment.

Table 4 summarizes the anticipated release rates and onsite storage required to meet established target release rates as proposed by the amendment.

The decrease in the anticipated sanitary flow results in an increase in allowable stormwater flow from the site. The total allowable combined release rate was **16.27 L/s** and the allowable stormwater release rate was equal to **13.15 L/s**. ($16.27 - 3.12 = 13.15$ L/s).

Table 4 - Proposed Amendment SWM Summary

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m ³)	100-Year Release Rate (L/s)	100-Year Storage (m ³)
Unattenuated Areas	3.16	0.00	6.77	0.00
Foundation Drainage	1.04	0.00	1.04	0.00
Attenuated Areas	2.77	33.29	5.34	64.15
Total	6.97	33.29	13.15	64.15

As demonstrated above, the proposed 100-year stormwater release rate is equal to the allowable of **13.15 L/s**.

Table 5, below, summarizes the pre-development and post-development flow rates to the combined sewershed.

Table 5 - Summary of Release Rates to the Combined Sewer

Flow Type	5-Year		100-year	
	Pre-Development (L/s)	Post-Development (L/s)	Pre-Development (L/s)	Post-Development (L/s)
Sanitary*	0.14	3.12	0.14	3.12
Storm**	21.71	6.97	46.50	13.15
Combined Flow	21.85	10.09	46.64	16.27
*Infiltration flows have been taken into account in stormwater calculations. Sanitary flow is equal to the peak dry weather flow.				
**No foundation drainage in pre-development.				

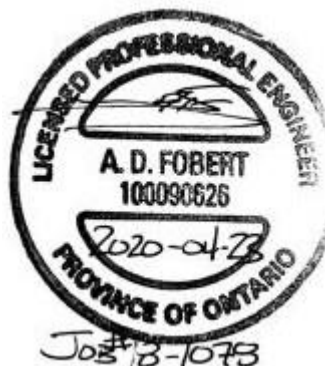
We trust that the above will be sufficient to support an amendment to the previously approved functional servicing and stormwater management report and allow the proposed development to proceed. Please contact the undersigned if you have any questions.

Prepared by,
David Schaeffer Engineering Ltd.

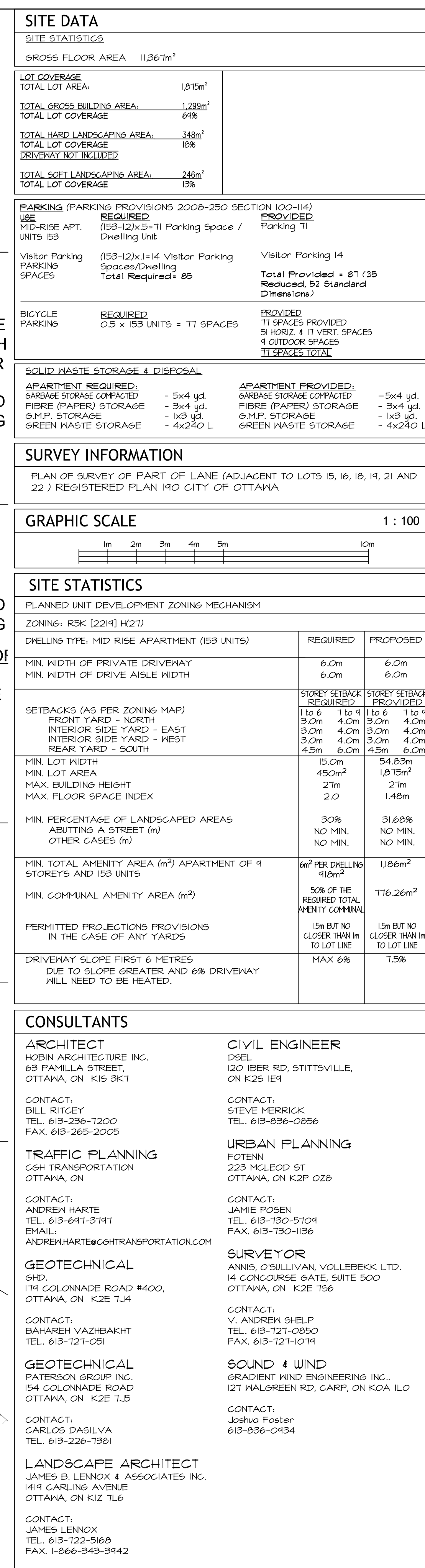
Reviewed by,
David Schaeffer Engineering Ltd.



Per: Brandon N. Chow



Per: Adam D. Fobert, P.Eng.

[illegible]

17	20/04/24	REV. FOR SITE PLAN CONTROL	
16	20/01/30	ISSUED FOR FOUNDATION PERMIT	
15	20/01/28	REV. FOR SITE PLAN CONTROL	
14	20/01/27	REV. FOR SITE PLAN CONTROL	
13	19/12/16	REV. FOR SITE PLAN CONTROL	
12	19/11/25	REV. FOR SITE PLAN CONTROL	
11	19/11/22	ISSUED FOR REVIEW	
10	19/11/15	REV. FOR SITE PLAN CONTROL	
9	19/10/23	REV. FOR SITE PLAN CONTROL	
8	19/08/12	REV. FOR SITE PLAN CONTROL	
7	19/07/30	REV. FOR SITE PLAN CONTROL	
6	19/03/07	ISSUED FOR SITE PLAN CONTROL	
5	19/03/05	ISSUED FOR CONSULTANT REVIEW	
4	19/02/28	ISSUED FOR CONSULTANT REVIEW	
3	19/02/26	ISSUED FOR CONSULTANT REVIEW	
2	19/02/25	ISSUED FOR CONSULTANT REVIEW	
1	19/01/30	ISSUED FOR CONSULTANT REVIEW	
no. date		revision	

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and/or omissions to the architect.

All contractors must comply with all pertinent codes and by-laws.

Do not scale drawings.

This drawing may not be used for construction until signed.

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Incorporated**

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HOBIN
ARCHITECTURE

project title
**ROBINSON VILLAGE
APARTMENT BUILDING**
35 ROBINSON AVENUE
OTTAWA, ONTARIO

drawing title
SITE PLAN

drawn K6	date JAN 10/2019	scale 1:100
		project 1B34
		drawing no. SP-1
		revision no.

36 ROBINSON - PROJECT STATS

OVERALL STATS

OVERALL STATS EXTERIOR FACE OF EXTERIOR WALLS

01a-Area Schedule (Gross Area- OBC)			
Level	Name	Number	Area
Not Placed	Area	P1-14	0.00 m²
Level 1	L1-GROSS	1-00	1,296.59 m²
Level 2	L2-GROSS	2-00	1,294.46 m²
Level 3			1,323.60 m²
Level 4			1,323.60 m²
Level 5			1,323.60 m²
Level 6			1,323.60 m²
Level 7			1,192.91 m²
Level 8			1,133.49 m²
Level 9			1,152.09 m²
Level 10			884.87 m²
Grand total			12,248.81 m²

01b-UNIT DISTRIBUTION	
Name	Count
1BED	81
2BED	32
3BED	20
BACH	20
Grand total	153

02a-BICYCLE PARKING	
Family	Count
10-BIKE STORAGE-wall	17
10-BIKE STORAGE & EXTERIOR	52
Grand total	77

02b-VEHICLE PARKING	
Family and Type	Count
00-Parking Space: 4600 x 2400mm - 90 deg	2
00-Parking Space: 4600 x 2600mm - 90 deg	27
00-Parking Space: 5200 x 2400mm - 90 deg	1
00-Parking Space: 5200 x 2600mm - 90 deg	54
00-Parking Space: 5200 x 3660mm - 90 deg	3
Grand total	87

INTERIOR OF OUTSIDE WALLS WITH EXCLUSIONS

03-Area Schedule (Gross Floor Area City of Ottawa (ZBL) Zoning Bylaw			
Level	Name	Area	Area Type
Level 1			
Level 1	COMMON AREA	3277.92 SF	Building Common Area
Level 1	SUITES	5901.60 SF	Floor Area
Level 1	SUITES	2833.71 SF	Floor Area
Level 1: 3		12013.24 SF	
Level 2			
Level 2	COMMON AREA	991.74 SF	Building Common Area
Level 2	SUITES	11734.36 SF	Floor Area
Level 2: 2		12726.09 SF	
Level 3 - Level 6			
Level 3	COMMON AREA	1038.19 SF	Building Common Area
Level 3	SUITES	11955.02 SF	Floor Area
Level 3: 2		12993.21 SF	
Level 7			
Level 7	COMMON AREA	913.00 SF	Building Common Area
Level 7	SUITES	10328.72 SF	Floor Area
Level 7: 2		11241.71 SF	
Level 8			
Level 8	COMMON AREA	909.39 SF	Building Common Area
Level 8	SUITES	10346.74 SF	Floor Area
Level 8: 2		11256.13 SF	
Level 9			
Level 9	COMMON AREA	887.29 SF	Building Common Area
Level 9	COMMON AREA	810.40 SF	Building Common Area
Level 9	SUITES	9558.45 SF	Floor Area
Level 9: 3		11256.13 SF	
Level 10			
Level 10	ELEV. LOBBY	595.35 SF	Floor Area
Level 10	MECHANICAL	1565.23 SF	Store Area
Level 10	CORRIDOR	165.18 SF	Store Area
Level 10	ELECTRICAL	250.68 SF	Store Area
Level 10: 4		2576.44 SF	
Grand total		74062.96 SF	

00-Area Schedule (Rentable - Client)			
Level	Name	Area	Count
Level 1			
Level 1	1BED	4,243.08 SF	7
Level 1	2BED	3,294.92 SF	4
Level 1	3BED	950.86 SF	1
Level 1	BACH	517.22 SF	1
Level 1		9,006.08 SF	13
Level 2			
Level 2	1BED	6,013.64 SF	10
Level 2	2BED	831.20 SF	1
Level 2	3BED	4,020.93 SF	4
Level 2	BACH	1,388.86 SF	3
Level 2		12,254.63 SF	18
Level 3			
Level 3	1BED	6,013.64 SF	10
Level 3	2BED	1,692.14 SF	2
Level 3	3BED	4,020.90 SF	4
Level 3	BACH	949.19 SF	2
Level 3		12,675.87 SF	18
Level 4			
Level 4	1BED	6,013.64 SF	10
Level 4	2BED	1,696.15 SF	2
Level 4	3BED	3,939.10 SF	4
Level 4	BACH	895.60 SF	2
Level 4		12,544.49 SF	18
Level 5			
Level 5	1BED	6,013.64 SF	10
Level 5	2BED	2,783.53 SF	3
Level 5	3BED	2,016.67 SF	2
Level 5	BACH	1,730.65 SF	3
Level 5		12,544.49 SF	18
Level 6			
Level 6	1BED	6,013.64 SF	10
Level 6	2BED	1,696.15 SF	2
Level 6	3BED	3,939.10 SF	4
Level 6	BACH	895.60 SF	2
Level 6		12,544.49 SF	18
Level 7			
Level 7	1BED	4,288.89 SF	8
Level 7	2BED	5,491.56 SF	7
Level 7	BACH	980.06 SF	2
Level 7		10,760.52 SF	17
Level 8			
Level 8	1BED	4,277.57 SF	8
Level 8	2BED	5,430.36 SF	7
Level 8	BACH	979.90 SF	2
Level 8		10,687.83 SF	17
Level 9			
Level 9	1BED	4,277.04 SF	8
Level 9	2BED	3,137.28 SF	4
Level 9	3BED	941.29 SF	1
Level 9	BACH	1,386.82 SF	3
Level 9		9,742.44 SF	16
Grand total		102,760.83 SF	153

Water Demand Design Flows per Unit Count
 City of Ottawa - Water Distribution Guidelines, July 2010



Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	-	0
Semi-detached	2.7	-	0
Townhouse	2.7	-	0
Apartment			0
Bachelor	1.4	58	82
1 Bedroom	1.4	121	170
2 Bedroom	2.1	13	28
3 Bedroom	3.1	-	0
Average	1.8	-	0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min
Total Domestic Demand	280	78.4	54.4	282.2	196.0	423.4	294.0

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min
Commercial floor space	2.5 L/m ² /d	-	0.00	0.0	0.0	0.0	0.0	0.0
Office	75 L/9.3m ² /d	-	0.00	0.0	0.0	0.0	0.0	0.0
Restaurant*	125 L/seat/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Total I/CI Demand			0.0	0.0	0.0	0.0	0.0	0.0
Total Demand			78.4	54.4	282.2	196.0	423.4	294.0

* Estimated number of seats at 1 seat per 9.3m²

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010



Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	-	0
Semi-detached	2.7	-	0
Townhouse	2.7	-	0
Apartment			0
Bachelor	1.4	20	28
1 Bedroom	1.4	81	114
2 Bedroom	2.1	32	68
3 Bedroom	3.1	20	62
Average	1.8	-	0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min
Total Domestic Demand	272	76.2	52.9	274.2	190.4	411.3	285.6

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min
Commercial floor space	2.5 L/m ² /d	-	0.00	0.0	0.0	0.0	0.0	0.0
Office	75 L/9.3m ² /d	-	0.00	0.0	0.0	0.0	0.0	0.0
Restaurant*	125 L/seat/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Total I/CI Demand			0.0	0.0	0.0	0.0	0.0	0.0
Total Demand			76.2	52.9	274.2	190.4	411.3	285.6

* Estimated number of seats at 1 seat per 9.3m²

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2012



Site Area

0.188 ha

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	0.01 L/s
Infiltration / Inflow (Wet)	0.05 L/s
Infiltration / Inflow (Total)	0.06 L/s

Extraneous Flow Allowances

Infiltration / Inflow 0.06 L/s

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Apartment			0
Bachelor	1.4	58	82
1 Bedroom	1.4	121	170
2 Bedroom	2.1	13	28
3 Bedroom	3.1		0
Average	1.8		0

Total Pop 280

Average Domestic Flow 0.91 L/s

Peaking Factor 3.47

Peak Domestic Flow 3.15 L/s

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Dining room	125 L/seat/d		0.00
Commercial floor space	28,000.0 L/ha/d		0.00
Water Closets**	150 L/hr		0.00
Laundry Facility	1,200 L/unit/d		0.00

Average I/C/I Flow 0.00

Peak Institutional / Commercial Flow 0.00

Peak I/C/I Flow 0.00

Total Estimated Average Dry Weather Flow Rate	0.92 L/s
Total Estimated Peak Dry Weather Flow Rate	3.20 L/s
Total Estimated Peak Wet Weather Flow Rate	3.33 L/s

Wastewater Design Flows per Unit Count
 City of Ottawa Sewer Design Guidelines, 2012



Site Area

0.188 ha

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	0.01 L/s
Infiltration / Inflow (Wet)	0.05 L/s
Infiltration / Inflow (Total)	0.06 L/s

Extraneous Flow Allowances

Infiltration / Inflow 0.06 L/s

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Apartment			0
Bachelor	1.4	20	28
1 Bedroom	1.4	81	114
2 Bedroom	2.1	32	68
3 Bedroom	3.1	20	62
Average	1.8		0

Total Pop 272

Average Domestic Flow 0.88 L/s

Peaking Factor 3.48

Peak Domestic Flow 3.06 L/s

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Dining room	125 L/seat/d		0.00
Commercial floor space	28,000.0 L/ha/d		0.00
Water Closets**	150 L/hr		0.00
Laundry Facility	1,200 L/unit/d		0.00

Average I/C/I Flow 0.00

Peak Institutional / Commercial Flow 0.00

Peak I/C/I Flow 0.00

Total Estimated Average Dry Weather Flow Rate	0.89 L/s
Total Estimated Peak Dry Weather Flow Rate	3.12 L/s
Total Estimated Peak Wet Weather Flow Rate	3.24 L/s

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012



Target Flow Rate

Area	0.188 ha	
C	0.40 Rational Method runoff coefficient	
t _c	10.0 min	
2-year		
i	76.8 mm/hr	
Q	16.0 L/s	
Ex. Sanitary Flow	0.27 L/s	*Based on 2 single family homes & 0.0114 ha of commercial building dry weather release. See Appendix C for calculations
Total Combined Allowable Release	16.27 L/s	<---- 2-Year Release (16.0 L/s) + Ex. Sanitary Flow (0.27 L/s)
Foundation Drainage	1.04 L/s	*Based on Geotechnical foundation drainage estimation of 90m ³ /day
Proposed Sanitary	3.20 L/s	*Based on an 192 proposed units, dry weather release rate. See Appendix C for Calculations
Total Allowable Stormwater Release	13.07 L/s	<---- Total Combined Release (16.27 L/s) - Proposed Sanitary Flow (3.20 L/s)

Estimated Post Development Peak Flow from Unattenuated Areas (U1 & U2)

Total Area 0.039 ha
C 0.28 Rational Method runoff coefficient

5-year						100-year				
t _c (min)	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
10.0	104.2	3.2	3.2	0.0	0.0	178.6	6.8	6.8	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Total Area 0.149 ha
C 0.88 Rational Method runoff coefficient

5-year						100-year				
t _c (min)	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
10	104.2	37.9	2.7	35.2	21.1	178.6	73.9	5.3	68.6	41.2
15	83.6	30.4	2.7	27.7	25.0	142.9	59.1	5.3	53.9	48.5
20	70.3	25.6	2.7	22.9	27.5	120.0	49.6	5.3	44.4	53.3
25	60.9	22.2	2.7	19.5	29.2	103.8	43.0	5.3	37.7	56.6
30	53.9	19.6	2.7	16.9	30.5	91.9	38.0	5.3	32.8	59.0
35	48.5	17.7	2.7	15.0	31.4	82.6	34.2	5.3	28.9	60.7
40	44.2	16.1	2.7	13.4	32.1	75.1	31.1	5.3	25.8	62.0
45	40.6	14.8	2.7	12.1	32.6	69.1	28.6	5.3	23.3	63.0
50	37.7	13.7	2.7	11.0	33.0	64.0	26.5	5.3	21.2	63.6
55	35.1	12.8	2.7	10.1	33.2	59.6	24.7	5.3	19.4	64.1
60	32.9	12.0	2.7	9.3	33.4	55.9	23.1	5.3	17.9	64.3
65	31.0	11.3	2.7	8.6	33.5	52.6	21.8	5.3	16.5	64.5
70	29.4	10.7	2.7	8.0	33.5	49.8	20.6	5.3	15.3	64.5
75	27.9	10.2	2.7	7.4	33.4	47.3	19.6	5.3	14.3	64.3
80	26.6	9.7	2.7	6.9	33.3	45.0	18.6	5.3	13.4	64.1
85	25.4	9.2	2.7	6.5	33.2	43.0	17.8	5.3	12.5	63.8
90	24.3	8.8	2.7	6.1	33.0	41.1	17.0	5.3	11.8	63.5
95	23.3	8.5	2.7	5.8	32.8	39.4	16.3	5.3	11.1	63.0
100	22.4	8.2	2.7	5.4	32.5	37.9	15.7	5.3	10.4	62.6
105	21.6	7.9	2.7	5.1	32.3	36.5	15.1	5.3	9.8	62.0
110	20.8	7.6	2.7	4.8	32.0	35.2	14.6	5.3	9.3	61.4

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

5-year Q _{attenuated}	2.73 L/s	100-year Q _{attenuated}	5.26 L/s
5-year Max. Storage Required	33.5 m ³	100-year Max. Storage Required	64.5 m ³

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m ³)	100-Year Release Rate (L/s)	100-Year Storage (m ³)
Unattenuated Areas	3.16	0.00	6.77	0.00
Foundation Drainage	1.04	0.00	1.04	0.00
Attenuated Areas	2.73	33.46	5.26	64.46
Total	6.93	33.46	13.07	64.46

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2012



Target Flow Rate

Area	0.188 ha	
C	0.40 Rational Method runoff coefficient	
t _c	10.0 min	
2-year		
i	76.8 mm/hr	
Q	16.0 L/s	
Ex. Sanitary Flow	0.27 L/s	*Based on 2 single family homes & 0.0114 ha of commercial building dry weather release. See Appendix C for calculations
Total Combined Allowable Release	16.27 L/s	<---- 2-Year Release (16.0 L/s) + Ex. Sanitary Flow (0.27 L/s)
Foundation Drainage	1.04 L/s	*Based on Geotechnical foundation drainage estimation of 90m ³ /day
Proposed Sanitary	3.12 L/s	*Based on 153 proposed units, dry weather release rate. See Appendix C for Calculations
Total Allowable Stormwater Release	13.15 L/s	<---- Total Combined Release (16.27 L/s) - Proposed Sanitary Flow (3.12 L/s)

Estimated Post Development Peak Flow from Unattenuated Areas (U1 & U2)

Total Area 0.039 ha
C 0.28 Rational Method runoff coefficient

5-year						100-year				
t _c (min)	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
10.0	104.2	3.2	3.2	0.0	0.0	178.6	6.8	6.8	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Total Area 0.149 ha
C 0.88 Rational Method runoff coefficient

5-year						100-year				
t _c (min)	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)	i (mm/hr)	Q _{actual} (L/s)	Q _{release} (L/s)	Q _{stored} (L/s)	V _{stored} (m ³)
10	104.2	37.9	2.7	35.2	21.1	178.6	73.9	5.3	68.6	41.1
15	83.6	30.4	2.7	27.7	24.9	142.9	59.1	5.3	53.8	48.4
20	70.3	25.6	2.8	22.8	27.4	120.0	49.6	5.3	44.3	53.2
25	60.9	22.2	2.8	19.4	29.1	103.8	43.0	5.3	37.6	56.5
30	53.9	19.6	2.8	16.9	30.4	91.9	38.0	5.3	32.7	58.8
35	48.5	17.7	2.8	14.9	31.3	82.6	34.2	5.3	28.8	60.6
40	44.2	16.1	2.8	13.3	32.0	75.1	31.1	5.3	25.8	61.8
45	40.6	14.8	2.8	12.0	32.5	69.1	28.6	5.3	23.2	62.7
50	37.7	13.7	2.8	10.9	32.8	64.0	26.5	5.3	21.1	63.4
55	35.1	12.8	2.8	10.0	33.1	59.6	24.7	5.3	19.3	63.8
60	32.9	12.0	2.8	9.2	33.2	55.9	23.1	5.3	17.8	64.1
65	31.0	11.3	2.8	8.5	33.3	52.6	21.8	5.3	16.4	64.2
70	29.4	10.7	2.8	7.9	33.3	49.8	20.6	5.3	15.3	64.1
75	27.9	10.2	2.8	7.4	33.2	47.3	19.6	5.3	14.2	64.0
80	26.6	9.7	2.8	6.9	33.1	45.0	18.6	5.3	13.3	63.7
85	25.4	9.2	2.8	6.5	33.0	43.0	17.8	5.3	12.4	63.4
90	24.3	8.8	2.8	6.1	32.8	41.1	17.0	5.3	11.7	63.0
95	23.3	8.5	2.8	5.7	32.6	39.4	16.3	5.3	11.0	62.6
100	22.4	8.2	2.8	5.4	32.3	37.9	15.7	5.3	10.3	62.1
105	21.6	7.9	2.8	5.1	32.0	36.5	15.1	5.3	9.8	61.5
110	20.8	7.6	2.8	4.8	31.7	35.2	14.6	5.3	9.2	60.9

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

5-year Q _{attenuated}	2.77 L/s	100-year Q _{attenuated}	5.34 L/s
5-year Max. Storage Required	33.3 m ³	100-year Max. Storage Required	64.2 m ³

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m ³)	100-Year Release Rate (L/s)	100-Year Storage (m ³)
Unattenuated Areas	3.16	0.00	6.77	0.00
Foundation Drainage	1.04	0.00	1.04	0.00
Attenuated Areas	2.77	33.29	5.34	64.15
Total	6.97	33.29	13.15	64.15