david schaeffer engineering ltd
SMART SUBDIVISIONS™

120 Iber Road, Unit 103
Stittsville, Ontario K2S 1E9
Tel (613) 836-0856
Fax (613) 836-7183
www.dsel.ca

MEMORANDUM

DATE: 2020-05-14 *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 May 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_2O / 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).

Foundation drainage will be collected and conveyed to the stormwater management system. Paterson Group estimated an average daily flow rate of 20,000 L/day would be collected and conveyed to the SWM system. See Geotechnical Investigation and Hydrogeological Review (PG5231-1) for additional information.

The groundwater flow was included as a continuous flow rate into the storage system and storage requirements were adjusted accordingly.

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	0.23	0.00	0.23	0.00
Attenuated Areas	3.19	31.71	6.15	61.15
Total	**6.58**	**31.71**	**13.15**	**61.15**

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**

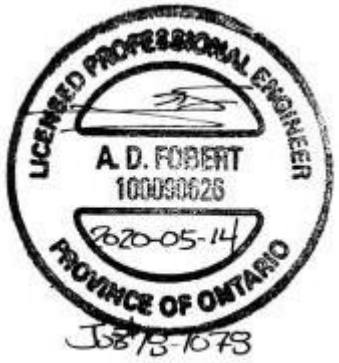
*Infiltration flows have been taken into account in stormwater calculations. Sanitary flow is equal to the peak dry weather flow.
**No foundation drainage in pre-development.

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.

Per: Brandon N. Chow

Reviewed by,
David Schaeffer Engineering Ltd.



Per: Adam D. Fobert, P.Eng.

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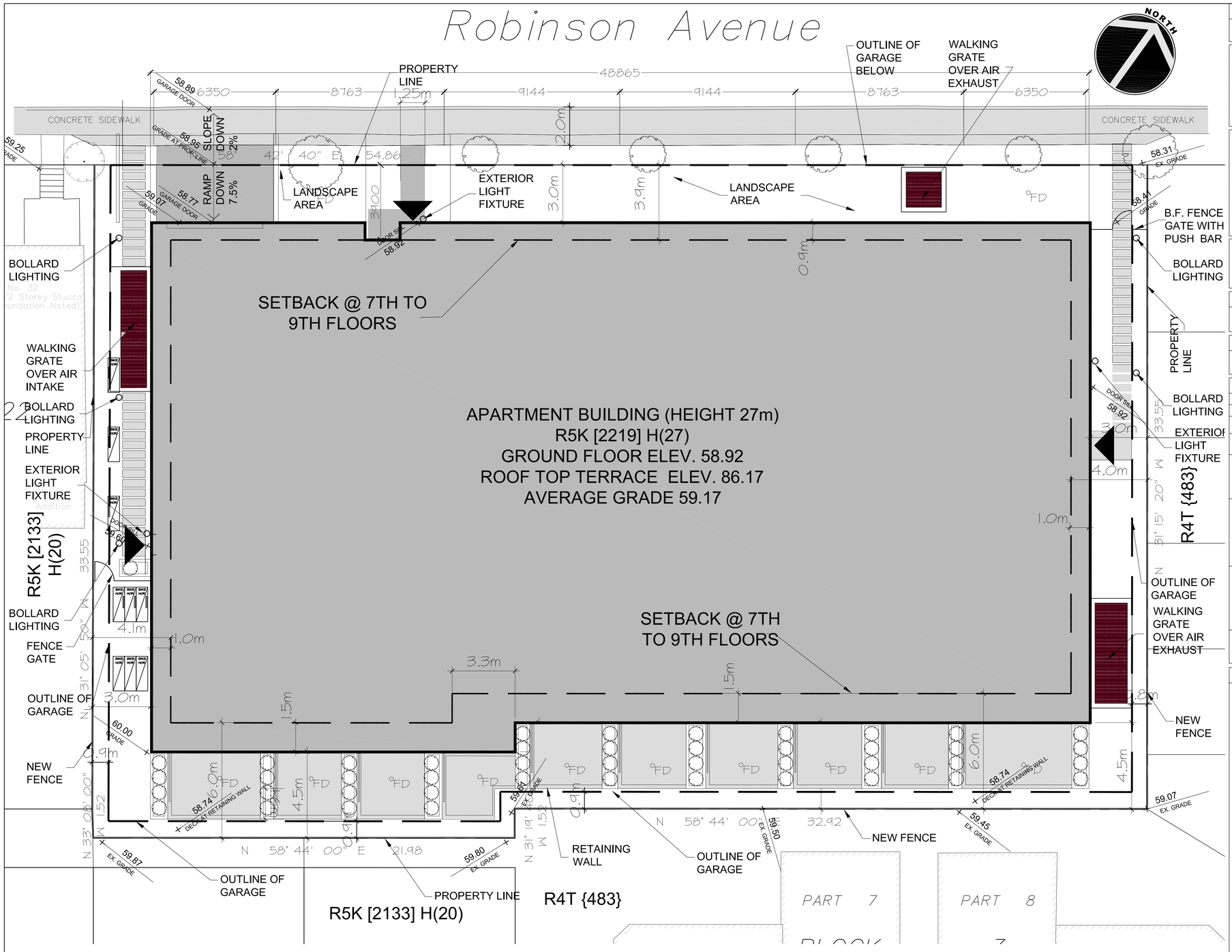

1 SITE PLAN
SP-1 1:100

SITE DATA

SITE STATISTICS

GROSS FLOOR AREA 11,367m²

LOT COVERAGE		
TOTAL LOT AREA:	1875m²	
TOTAL GROSS BUILDING AREA:	1,299m²	
TOTAL LOT COVERAGE	69%	
TOTAL HARD LANDSCAPING AREA:	348m²	
TOTAL LOT COVERAGE	18%	
DRIVEWAY NOT INCLUDED		
TOTAL SOFT LANDSCAPING AREA:	246m²	
TOTAL LOT COVERAGE	13%	

PARKING (PARKING PROVISIONS 2008-250 SECTION 100-114)

USE	REQUIRED	PROVIDED
MID-RISE APT. UNITS 153	(153-12)x.5=71 Parking Space / Dwelling Unit	Parking 71
Visitor Parking PARKING SPACES	(153-12)x.1=14 Visitor Parking Spaces/Dwelling Total Required= 85	Visitor Parking 14 Total Provided = 87 (35 Reduced, 52 Standard Dimensions)

BICYCLE PARKING	REQUIRED	PROVIDED
	0.5 x 153 UNITS = 77 SPACES	77 SPACES PROVIDED 51 HORIZ. & 17 VERT. SPACES 9 OUTDOOR SPACES 77 SPACES TOTAL

SOLID WASTE STORAGE & DISPOSAL

APARTMENT REQUIRED:		APARTMENT PROVIDED:	
GARBAGE STORAGE COMPACTED	- 5x4 yd.	GARBAGE STORAGE COMPACTED	- 5x4 yd.
FIBRE (PAPER) STORAGE	- 3x4 yd.	FIBRE (PAPER) STORAGE	- 3x4 yd.
G.M.P. STORAGE	- 1x3 yd.	G.M.P. STORAGE	- 1x3 yd.
GREEN WASTE STORAGE	- 4x240 L	GREEN WASTE STORAGE	- 4x240 L

SURVEY INFORMATION

PLAN OF SURVEY OF PART OF LANE (ADJACENT TO LOTS 15, 16, 18, 19, 21 AND 22) REGISTERED PLAN 190 CITY OF OTTAWA

GRAPHIC SCALE 1 : 100

1m 2m 3m 4m 5m 10m

SITE STATISTICS

PLANNED UNIT DEVELOPMENT ZONING MECHANISM

ZONING: R5K [2219] H(27)

DWELLING TYPE: MID RISE APARTMENT (153 UNITS)	REQUIRED	PROPOSED
MIN. WIDTH OF PRIVATE DRIVEWAY	6.0m	6.0m
MIN. WIDTH OF DRIVE AISLE WIDTH	6.0m	6.0m
	STOREY SETBACK REQUIRED	STOREY SETBACK PROVIDED
SETBACKS (AS PER ZONING MAP)	to 6 7 to 9	to 6 7 to 9
FRONT YARD - NORTH	3.0m 4.0m	3.0m 4.0m
INTERIOR SIDE YARD - EAST	3.0m 4.0m	3.0m 4.0m
INTERIOR SIDE YARD - WEST	3.0m 4.0m	3.0m 4.0m
REAR YARD - SOUTH	4.5m 6.0m	4.5m 6.0m
MIN. LOT WIDTH	15.0m	54.83m
MIN. LOT AREA	450m²	1,875m²
MAX. BUILDING HEIGHT	27m	27m
MAX. FLOOR SPACE INDEX	2.0	1.48m
MIN. PERCENTAGE OF LANDSCAPED AREAS	30%	31.68%
ABUTTING A STREET (m)	NO MIN.	NO MIN.
OTHER CASES (m)	NO MIN.	NO MIN.
MIN. TOTAL AMENITY AREA (m²) APARTMENT OF 9 STOREYS AND 153 UNITS	6m² PER DWELLING 918m²	1,186m²
MIN. COMMUNAL AMENITY AREA (m²)	50% OF THE REQUIRED TOTAL AMENITY COMMUNAL	776.26m²
PERMITTED PROJECTIONS PROVISIONS IN THE CASE OF ANY YARDS	1.5m BUT NO CLOSER THAN 1m TO LOT LINE	1.5m BUT NO CLOSER THAN 1m TO LOT LINE
DRIVEWAY SLOPE FIRST 6 METRES DUE TO SLOPE GREATER AND 6% DRIVEWAY WILL NEED TO BE HEATED.	MAX 6%	7.5%

CONSULTANTS

ARCHITECT
HOBIN ARCHITECTURE INC.
63 PAMILLA STREET,
OTTAWA, ON K1S 3K7

CONTACT:
BILL RITGEY
TEL. 613-236-7200
FAX. 613-265-2005

TRAFFIC PLANNING
CGH TRANSPORTATION
OTTAWA, ON

CONTACT:
ANDREW HARTE
TEL. 613-647-3747
EMAIL:
ANDREW.HARTE@CGHTRANSPORTATION.COM

GEOTECHNICAL
GHD.
1174 COLONNADE ROAD #400,
OTTAWA, ON K2E 7J4

CONTACT:
BAHAREH VAZHBAKHT
TEL. 613-727-0551

GEOTECHNICAL
PATERSON GROUP INC.
154 COLONNADE ROAD
OTTAWA, ON K2E 7J5

CONTACT:
CARLOS DASILVA
TEL. 613-226-7381

LANDSCAPE ARCHITECT
JAMES B. LENNOX & ASSOCIATES INC.
1419 CARLING AVENUE
OTTAWA, ON K1Z 7L6

CONTACT:
JAMES LENNOX
TEL. 613-722-5168
FAX. 1-866-343-3942

CIVIL ENGINEER
DSEL
120 IBER RD, STITTSVILLE,
ON K2S 1E9

CONTACT:
STEVE MERRICK
TEL. 613-836-0856

URBAN PLANNING
FOTENN
223 MCLEOD ST
OTTAWA, ON K2P 0Z8

CONTACT:
JAMIE POSEN
TEL. 613-730-5709
FAX. 613-730-1136

SURVEYOR
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
OTTAWA, ON K2E 7S6

CONTACT:
V. ANDREW SHELP
TEL. 613-727-0850
FAX. 613-727-1079

SOUND & WIND
GRADIENT WIND ENGINEERING INC..
127 WALGREEN RD, CARP, ON K0A 1L0

CONTACT:
Joshua Foster
613-836-0934

no.	date	revision
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

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.

Hobin Architecture Incorporated
63 Pamilla Street
Ottawa, Ontario
Canada K1S 3K7
T: 613-238-7200
F: 613-235-2005
E: mail@hobinarc.com
hobinarc.com
HOBIN ARCHITECTURE

project title
ROBINSON VILLAGE
APARTMENT BUILDING
39 ROBINSON AVENUE
OTTAWA, ONTARIO

drawing title
SITE PLAN

drawn	date	scale
KG	JAN. 10/2019	1:100

project 1834
drawing no. SP-1
revision no.

ONTARIO ASSOCIATION OF ARCHITECTS
LARRY J. HOBIN
LICENCE 3049

D07-12-19-0044

17908

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

HOBIN ARCHITECTURE

STATS SHEET

36 ROBINSON AVENUE

Section x-1.00

April 20, 2020

TC United Development Corporation
36 Robinson Avenue
Proposed Conditions
(Previously Approved)

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

				Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**		**Units**	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 $9.3m^2$

TC United Development Corporation
36 Robinson Avenue
Proposed Conditions
(Proposed Amendment)

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 9.3m^2

TC United Development Corporation
36 Robinson Avenue
Proposed Development
(Previously Approved)

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
			0
Apartment			
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**

TC United Development Corporation
36 Robinson Avenue
Proposed Development
(Proposed Amendment)

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
			0
Apartment			
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 ca
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
Attenutated 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 cal
Total Combined Allowable Release	**16.27**	**L/s**	**<---- 2-Year Release (16.0 L/s) + Ex. Sanitary Flow (0.27 L/s)**
Foundation Drainage/ Groundwtr Infilltration Q	20000	L/day	*As per Geotechnical Investigation (PG5231-1) prepared by Paterson Group and dated May 12th, 2020.
Q	0.23	L/s	
Proposed Sanitary Flow	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	3.2	34.8	20.9	178.6	73.9	6.1	67.8	40.7
15	83.6	30.4	3.2	27.3	24.5	142.9	59.1	6.1	53.0	47.7
20	70.3	25.6	3.2	22.4	26.9	120.0	49.6	6.1	43.5	52.2
25	60.9	22.2	3.2	19.0	28.5	103.8	43.0	6.1	36.8	55.2
30	53.9	19.6	3.2	16.5	29.6	91.9	38.0	6.1	31.9	57.4
35	48.5	17.7	3.2	14.5	30.4	82.6	34.2	6.1	28.0	58.9
40	44.2	16.1	3.2	12.9	31.0	75.1	31.1	6.1	25.0	59.9
45	40.6	14.8	3.2	11.6	31.4	69.1	28.6	6.1	22.4	60.6
50	37.7	13.7	3.2	10.5	31.6	64.0	26.5	6.1	20.3	61.0
55	35.1	12.8	3.2	9.6	31.7	59.6	24.7	6.1	18.5	61.1
60	32.9	12.0	3.2	8.8	31.7	55.9	23.1	6.1	17.0	61.1
65	31.0	11.3	3.2	8.1	31.7	52.6	21.8	6.1	15.6	61.0
70	29.4	10.7	3.2	7.5	31.5	49.8	20.6	6.1	14.5	60.7
75	27.9	10.2	3.2	7.0	31.3	47.3	19.6	6.1	13.4	60.3
80	26.6	9.7	3.2	6.5	31.1	45.0	18.6	6.1	12.5	59.9
85	25.4	9.2	3.2	6.0	30.8	43.0	17.8	6.1	11.6	59.3
90	24.3	8.8	3.2	5.6	30.5	41.1	17.0	6.1	10.9	58.7
95	23.3	8.5	3.2	5.3	30.2	39.4	16.3	6.1	10.2	58.0
100	22.4	8.2	3.2	5.0	29.8	37.9	15.7	6.1	9.5	57.2
105	21.6	7.9	3.2	4.7	29.4	36.5	15.1	6.1	9.0	56.4
110	20.8	7.6	3.2	4.4	28.9	35.2	14.6	6.1	8.4	55.6

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 $Q_{attenuated}$	**3.19 L/s**	**100-year $Q_{attenuated}$**	**6.15 L/s**
5-year Max. Storage Required	**31.7 m^3**	**100-year Max. Storage Required**	**61.1 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	0.23	0.00	0.23	0.00
Attenutated Areas	3.19	31.71	6.15	61.15
Total	**6.58**	**31.71**	**13.15**	**61.15**