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STORMWATER MANAGEMENT MEMORANDUM

DATE: 2020-05-28 *EMAIL*

TO: **City of Ottawa IAD Review Officer**

SUBJECT: **Stormwater Management Memorandum – 3713 Borrisokane Road**
City File Number: D07-12-20-0002

OUR FILE: DSEL Project No. 19-1134

ATTACHMENTS:
- Storm Sewer Calculation Sheet – Caivan Communities – Brazeau Phase 1, Dated May 28, 2020

The subject property, 3713 Borrisokane Road, is located within the City of Ottawa. As illustrated in ***Figure 1***, the subject property is located approximately 500 m south of the intersection of Borrisokane Road and Cambrian Road.

Figure 1: Site Location

Caivan Greenbank North Inc has retained DSEL to prepare a stormwater management memorandum in support of the development at 3713 Borrisokane Road. The following memo reviews the serviceability of the proposed development towards the future development adjacent to the subject site.

As shown by ***Figure 1***, development is proposed North and East of the subject site. The services proposed as part of the future development are proposed by City Application No. D07-16-19-0005, herein referred to ***The Ridge Subdivision Servicing Design***.

The stormwater management will be required to adhere to the following design criteria:

- Established a post-development release rate based on the calculated 2-year pre-development flow rate;
- Attenuate all storms up to and including the City of Ottawa 100-year design event on site; and
- Meet the quality control target of 80% TSS removal as per the Jock River Reach One Subwatershed Study (Stantec, 2007); and,

Based on the above, the allowable release rate for the proposed development is ***210.4 L/s***.

As demonstrated by the Site Servicing and Stormwater Management Report – 3713 Borrisokane Road, prepared by DSEL and dated May 2020, stormwater will be attenuated up to and including the City of Ottawa design event on-site to the established release rate of ***210.4 L/s***. Quality controls will be provided on-site via an *Aquaswirl AS-7* oil/grit separator or an approved equivalent.

The Ridge Subdivision Servicing Design proposes a storm sewer system through a network of residential right-of-ways. A stormwater management pond is proposed directly north of the subject site. It is contemplated that the subject site will be tributary to ***MH134***, which will be located directly south of the subject site within the future roadway (Haiku Street). Installation of approximately 132m of sewer is estimated at $88,800.

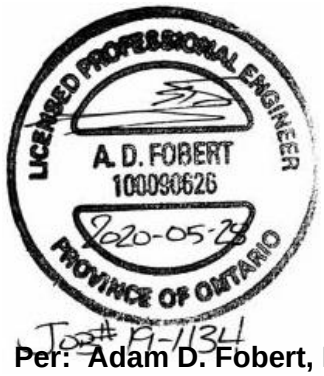
Based on coordination with the designers of ***The Ridge Subdivision Servicing Design***, flows from the subject site were contemplated to outlet to the future “Expansion Road” between Nodes 133 and 134. As shown by the storm sewer calculation sheet included in the ***Appendix***, there is sufficient capacity to accommodate the development.

DSEL trusts that the above will be sufficient to support an amendment to the previously approved grading plan to allow the proposed development to proceed. Please contact the undersigned if you have any questions.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Alison J. Gosling, EIT.

Reviewed by,
David Schaeffer Engineering Ltd.



Per: Adam D. Fobert, P.Eng.

Z:\Projects\19-1134_ABIC_Caivan\B_Design\B3_Reports\B3-2_Servicing (DSEL)\2020-05-28_MEMO-FULL-SERV\2020-05-28_1134_memo_ajg.docx

APPENDIX

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)														FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
FUTURE ROAD (DRUMMOND LAND)																																
	Plug	304	1.20	0.65	2.17	2.17			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	167	600	600	CONC	0.20	10.0	274.6	0.97	0.17	0.61
To Expansion Road, Pipe 304 - 306TEE						2.17				0.00				0.00				0.00	10.17														
			1.00	0.65	1.81	1.81			0.00	0.00			0.00	0.00			0.00	0.00	15.00														
					0.00	1.81	1.45	0.40	1.61	1.61			0.00	0.00			0.00	0.00	15.00														
	Plug	303			0.00	1.81			0.00	1.61			0.00	0.00			0.00	0.00	15.11	61.51	83.20	97.44	142.28	245	750	750	CONC	0.15	10.5	431.2	0.98	0.18	0.57
To Expansion Road, Pipe 303 - 304						1.81				1.61				0.00				0.00	15.29														
			0.99	0.65	1.79	1.79																										
	Plug	302			0.00	1.79			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	137	525	525	CONC	0.20	10.5	192.3	0.89	0.20	0.71
To Expansion Road, Pipe 302 - 303						1.79				0.00				0.00				0.00	10.20														
COMMERCIAL BLOCK - SOUTH																																
			7.35	0.25	5.11	5.11																										
			13.83	0.25	9.61	14.72			0.00	0.00			0.00	0.00			0.00	0.00	13.00														
	CTRL MH 1	133			0.00	14.72			0.00	0.00			0.00	0.00			0.00	0.00	13.00	66.93	90.63	106.17	155.11	985	1500	1500	CONC	0.20	19.0	3161.3	1.79	0.18	0.31
To Haiku Street, Pipe 133 - 134						14.72				0.00				0.00				0.00	13.18														
Haiku Street																																
COMMERCIAL BLOCK - SOUTH, Pipe CTRL MH 1 - 133						14.72				0.00				0.00				0.00	13.18														
From ABIC Property			7.39	0.30																				210.40								
	133	134	0.58	0.90	1.45	16.17			0.00	0.00			0.00	0.00			0.00	0.00	13.18	66.43	89.95	105.37	153.93	1285	1500	1500	CONC	0.15	77.0	2737.8	1.55	0.83	0.47
	134	135	0.31	0.90	0.78	16.95			0.00	0.00			0.00	0.00			0.00	0.00	14.01	64.22	86.91	101.80	148.69	1299	1500	1500	CONC	0.15	61.0	2737.8	1.55	0.66	0.47
			0.05	0.54	0.08	17.02			0.00	0.00			0.00	0.00			0.00	0.00	14.01														
	135	136	0.18	0.71	0.36	17.38			0.00	0.00			0.00	0.00			0.00	0.00	14.01	64.22	86.91	101.80	148.69	1326	1650	1650	CONC	0.10	37.0	2882.2	1.35	0.46	0.46
To Expansion Road, Pipe 136 - 302						17.38				0.00				0.00				0.00	14.46														
Sturnidae Street																																
					0.00	0.00	0.03	0.71	0.06	0.06			0.00	0.00			0.00	0.00															
			0.10	0.54	0.15	0.15			0.00	0.06			0.00	0.00			0.00	0.00															
	126	127	0.19	0.71	0.38	0.53			0.00	0.06			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	47	300	300	PVC	0.40	28.5	61.2	0.87	0.55	0.76
To Montology Way, Pipe 127 - 128						0.53				0.06				0.00				0.00	10.55														
			0.23	0.54	0.35	0.35			0.00	0.00			0.00	0.00			0.00	0.00															
	124	125	0.36	0.71	0.71	1.06			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	81	375	375	PVC	0.35	101.0	103.7	0.94	1.79	0.78
			0.21	0.54	0.32	1.37			0.00	0.00			0.00	0.00			0.00	0.00															
	125	127	0.34	0.71	0.67	2.04			0.00	0.00			0.00	0.00			0.00	0.00	11.79	70.55	95.59	112.01	163.68	144	600	600	CONC	0.25	91.5	307.0	1.09	1.40	0.47
To Montology Way, Pipe 127 - 128						2.04				0.00				0.00				0.00	13.20														
Montology Way																																
Contribution From Travertine Way, Pipe 123 - 127						1.33				0.00				0.00				0.00	12.08														
Contribution From Sturnidae Street, Pipe 125 - 127						2.04				0.00				0.00				0.00	13.20														
Contribution From Sturnidae Street, Pipe 126 - 127						0.53				0.06				0.00				0.00	10.55														
	127	128			0.00	3.90			0.00	0.06			0.00	0.00			0.00	0.00	13.20	66.38	89.87	105.28	153.80	264	675	675	CONC	0.20	54.0	375.9	1.05	0.86	0.70
	128	129			0.00	3.90			0.00	0.06			0.00	0.00			0.00	0.00	14.05	64.10	86.74	101.60	148.40	255	675	675	CONC	0.30	13.5	460.4	1.29	0.17	0.55
			0.25	0.54	0.38	4.27			0.00	0.06			0.00	0.00			0.00	0.00															
	129	130	0.40	0.71	0.79	5.06			0.00	0.06			0.00	0.00			0.00	0.00	14.23	63.65	86.14	100.88	147.35	327	750	750	CONC	0.15	77.0	431.2	0.98	1.31	0.76
			0.18	0.54	0.27	5.33			0.00	0.06			0.00	0.00			0.00	0.00															
	130	131	0.40	0.71	0.79	6.12			0.00	0.06			0.00	0.00			0.00	0.00	15.54	60.51	81.84	95.83	139.93	375	750	750	CONC	0.15	100.5	431.2	0.98	1.72	0.87
	131	132			0.00	6.12			0.00	0.06			0.00	0.00			0.00	0.00	17.26	56.90	76.90	90.03	131.41	353	1200	1200	CONC	0.15	12.0	1510.0	1.34	0.15	0.23
To Travertine Way, Pipe 132 - 136						6.12				0.06				0.00				0.00	17.41														
Rugosa Street																																
	211	212	0.26	0.54	0.39	0.39			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	30	300	300	PVC	0.35	26.5	57.2	0.81	0.55	0.52
To Appalachian Circle, Pipe 212 - 213						0.39				0.00				0.00				0.00	10.55														
	212	204			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.50	92.5	68.4	0.97	1.59	0.00
			0.49	0.54	0.74	0.74			0.00	0.00			0.00	0.00			0.00	0.00															
	204	205	0.50	0.71	0.99	1.72			0.00	0.00			0.00	0.00			0.00	0.00	11.59	71.18	96.47	113.04	165.19	123	525	525	CONC	0.20	118.0	192.3	0.89	2.21	0.64

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: SLM	PROJECT: **Ciavan Communities - Brazeau Phase 1**
Checked: ADF	LOCATION: **City of Ottawa**
Dwg. Reference: Storm Drainage Plan 84-87	File Ref: 18-1030 / Date: 24-Apr-20 / Sheet No. 1 OF 6

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)														FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
	205	206	0.25	0.71	0.49	2.22			0.00	0.00			0.00	0.00			0.00	0.00	13.81	64.73	87.62	102.63	149.91	143	525	525	CONC	0.20	16.0	192.3	0.89	0.30	0.75
To Appalachian Circle, Pipe 206 - 207						2.22				0.00				0.00				0.00	14.11														
Appalachian Circle																																	
	209	210			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	2.40	13.0	149.8	2.12	0.10	0.00
	210	212	0.20	0.71	0.39	0.39			0.00	0.00			0.00	0.00			0.00	0.00	10.10	76.41	103.66	121.51	177.63	30	300	300	PVC	3.80	54.0	188.5	2.67	0.34	0.16
Contribution From Rugosa Street, Pipe 211 - 212						0.39				0.00				0.00				0.00	10.55														
	212	213			0.00	0.79			0.00	0.00			0.00	0.00			0.00	0.00	10.55	74.77	101.40	118.85	173.72	59	375	375	PVC	0.45	49.5	117.6	1.06	0.77	0.50
	213	214	0.12	0.71	0.24	1.02			0.00	0.00			0.00	0.00			0.00	0.00	11.32	72.08	97.70	114.49	167.33	74	375	375	PVC	1.00	13.5	175.3	1.59	0.14	0.42
			0.36	0.54	0.54	1.56			0.00	0.00			0.00	0.00			0.00	0.00														
	214	215	0.44	0.71	0.87	2.43			0.00	0.00			0.00	0.00			0.00	0.00	11.46	71.61	97.06	113.74	166.21	174	375	375	PVC	2.35	90.0	268.8	2.43	0.62	0.65
To Foundation Lane, Pipe 215 - 119						2.43				0.00				0.00				0.00	12.08														
			0.07	0.54	0.11	0.11			0.00	0.00			0.00	0.00			0.00	0.00														
	209	201	0.25	0.71	0.49	0.60			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	46	300	300	PVC	0.55	94.0	71.7	1.01	1.54	0.64
			0.10	0.54	0.15	0.75			0.00	0.00			0.00	0.00			0.00	0.00														
	201	202	0.37	0.71	0.73	1.48			0.00	0.00			0.00	0.00			0.00	0.00	11.54	71.34	96.69	113.30	165.58	106	375	375	PVC	0.90	119.5	166.3	1.51	1.32	0.63
	202	203			0.00	1.48			0.00	0.00			0.00	0.00			0.00	0.00	12.87	67.31	91.15	106.78	156.00	100	450	450	CONC	0.20	14.0	127.5	0.80	0.29	0.78
			0.20	0.54	0.30	1.78			0.00	0.00			0.00	0.00			0.00	0.00														
	203	206	0.20	0.71	0.39	2.17			0.00	0.00			0.00	0.00			0.00	0.00	13.16	66.49	90.02	105.46	154.06	145	450	450	CONC	0.45	54.5	191.3	1.20	0.76	0.76
Contribution From Rugosa Street, Pipe 205 - 206						2.22				0.00				0.00				0.00	14.11														
			0.08	0.54	0.12	4.51			0.00	0.00			0.00	0.00			0.00	0.00														
	206	207	0.14	0.71	0.28	4.79			0.00	0.00			0.00	0.00			0.00	0.00	14.11	63.96	86.56	101.38	148.07	306	600	600	CONC	0.40	49.5	388.3	1.37	0.60	0.79
	207	208			0.00	4.79			0.00	0.00			0.00	0.00			0.00	0.00	14.71	62.47	84.51	98.98	144.54	299	600	600	CONC	1.90	12.5	846.4	2.99	0.07	0.35
			0.12	0.54	0.18	4.97			0.00	0.00			0.00	0.00			0.00	0.00														
	208	215	0.32	0.71	0.63	5.60			0.00	0.00			0.00	0.00			0.00	0.00	14.78	62.30	84.28	98.70	144.15	349	600	600	CONC	1.90	112.0	846.4	2.99	0.62	0.41
To Foundation Lane, Pipe 215 - 119						5.60				0.00				0.00				0.00	15.40														
Foundation Lane																																	
Contribution From Appalachian Circle, Pipe 208 - 215						5.60				0.00				0.00				0.00	15.40														
Contribution From Appalachian Circle, Pipe 214 - 215						2.43				0.00				0.00				0.00	12.08														
	215	119	0.20	0.71	0.39	8.42			0.00	0.00			0.00	0.00			0.00	0.00	15.40	60.84	82.28	96.35	140.69	512	675	675	CONC	1.60	55.0	1063.3	2.97	0.31	0.48
To Travertine Way, Pipe 119 - 120						8.42				0.00				0.00				0.00	15.71														
Travertine Way																																	
			0.15	0.54	0.23	0.23			0.00	0.00			0.00	0.00			0.00	0.00														
	119	122	0.21	0.71	0.41	0.64			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	49	300	300	PVC	0.55	90.0	71.7	1.01	1.48	0.69
			0.13	0.71	0.26	0.90			0.00	0.00			0.00	0.00			0.00	0.00														
	122	123	0.29	0.54	0.44	1.33			0.00	0.00			0.00	0.00			0.00	0.00	11.48	71.56	96.98	113.65	166.09	95	300	300	PVC	1.55	13.0	120.4	1.70	0.13	0.79
	123	127			0.00	1.33			0.00	0.00			0.00	0.00			0.00	0.00	11.61	71.14	96.41	112.98	165.10	95	300	300	PVC	1.60	49.5	122.3	1.73	0.48	0.77
To Montology Way, Pipe 127 - 128						1.33				0.00				0.00				0.00	12.08														
Contribution From Foundation Lane, Pipe 215 - 119						8.42				0.00				0.00				0.00	15.71														
			0.21	0.71	0.41	8.84			0.00	0.00			0.00	0.00			0.00	0.00														
	119	120	0.39	0.54	0.59	9.42			0.00	0.00			0.00	0.00			0.00	0.00	15.71	60.14	81.33	95.23	139.05	567	900	900	CONC	0.20	103.0	809.6	1.27	1.35	0.70
	120	121			0.00	9.42			0.00	0.00			0.00	0.00			0.00	0.00	17.06	57.30	77.45	90.67	132.35	540	900	900	CONC	0.20	14.0	809.6	1.27	0.18	0.67
			0.21	0.54	0.32	9.74			0.00	0.00			0.00	0.00			0.00	0.00														
	121	132	0.52	0.71	1.03	10.77			0.00	0.00			0.00	0.00			0.00	0.00	17.24	56.94	76.95	90.08	131.50	613	900	900	CONC	1.10	114.0	1898.7	2.98	0.64	0.32
Contribution From Montology Way, Pipe 131 - 132						6.12				0.06				0.00				0.00	17.41														
			0.17	0.71	0.34	17.22			0.00	0.06			0.00	0.00			0.00	0.00														
	132	136	0.42	0.54	0.63	17.85			0.00	0.06			0.00	0.00			0.00	0.00	17.88	55.71	75.28	88.12	128.62	999	1200	1200	CONC	0.20	59.5	1743.6	1.54	0.64	0.57
To Expansion Road, Pipe 136 - 302						17.85				0.06				0.00				0.00	18.52														
Focality Crescent																																	
	107	108			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.65	13.0	78.0	1.10	0.20	0.00
			0.28	0.72	0.56	0.56			0.00	0.00			0.00	0.00			0.00	0.00														
	108	110	0.34	0.58	0.55	1.11			0.00	0.00			0.00	0.00			0.00	0.00	10.20	76.06	103.17	120.93	176.78	84	450	450	CONC	0.20	54.0	127.5	0.80	1.12	0.66
To Haiku Street, Pipe 110 - 111						1.11				0.00				0.00				0.00	11.32														

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: SLM	PROJECT: **Ciavan Communities - Brazeau Phase 1**		
Checked: ADF	LOCATION: **City of Ottawa**		
Dwg. Reference: Storm Drainage Plan 83-86	File Ref: 18-1030	Date: 22-Apr-20	Sheet No. 2 OF 6

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)														FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
	107	112			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.35	74.0	57.2	0.81	1.52	0.00
			0.04	0.72	0.08	0.08			0.00	0.00			0.00	0.00			0.00	0.00														
			0.15	0.58	0.24	0.32			0.00	0.00			0.00	0.00			0.00	0.00														
			0.22	0.58	0.35	0.68			0.00	0.00			0.00	0.00			0.00	0.00														
	112	113	0.33	0.72	0.66	1.34			0.00	0.00			0.00	0.00			0.00	0.00	11.52	71.41	96.78	113.41	165.73	95	450	450	CONC	0.20	73.5	127.5	0.80	1.53	0.75
	113	114			0.00	1.34			0.00	0.00			0.00	0.00			0.00	0.00	13.05	66.78	90.43	105.94	154.76	89	450	450	CONC	0.20	13.0	127.5	0.80	0.27	0.70
			0.32	0.72	0.64	1.98			0.00	0.00			0.00	0.00			0.00	0.00														
	114	115	0.34	0.58	0.55	2.53			0.00	0.00			0.00	0.00			0.00	0.00	13.32	66.03	89.40	104.73	152.98	167	675	675	CONC	0.40	54.0	531.6	1.49	0.61	0.31
To Haiku Street, Pipe 115 - 116						2.53				0.00				0.00				0.00	13.93														
COMMERCIAL BLOCK - EAST																																
			2.68	0.75	5.59	5.59			0.00	0.00			0.00	0.00			0.00	0.00	12.50													
	CTRL MH 2	2260			0.00	5.59			0.00	0.00			0.00	0.00			0.00	0.00	12.50	68.38	92.61	108.51	158.53	382	675	675	CONC	0.40	10.0	531.6	1.49	0.11	0.72
To Obsidian Street, Pipe 2260 - 227						5.59				0.00				0.00				0.00	12.61														
Obsidian Street																																
	225	226	0.27	0.72	0.54	0.54			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	42	300	300	PVC	0.50	99.5	68.4	0.97	1.71	0.61
	226	2260	0.20	0.72	0.40	0.94			0.00	0.00			0.00	0.00			0.00	0.00	11.71	70.79	95.93	112.41	164.27	67	300	300	PVC	1.05	64.0	99.1	1.40	0.76	0.67
From COMMERCIAL BLOCK - EAST- 122, Pipe CTRL MH 2 - 2260						5.59				0.00				0.00				0.00	12.61														
	2260	227			0.00	6.53			0.00	0.00			0.00	0.00			0.00	0.00	12.61	68.05	92.16	107.97	157.75	444	675	675	CONC	1.55	49.5	1046.5	2.92	0.28	0.42
	227	109	0.26	0.72	0.52	7.05			0.00	0.00			0.00	0.00			0.00	0.00	12.89	67.23	91.04	106.66	155.82	474	675	675	CONC	1.60	93.0	1063.3	2.97	0.52	0.45
To Haiku Street, Pipe 109 - 110						7.05				0.00				0.00				0.00	13.42														
Haiku Street																																
			1.93	0.68	3.65	3.65			0.00	0.00			0.00	0.00			0.00	0.00	11.50													
	CTRL MH 3	109			0.00	3.65			0.00	0.00			0.00	0.00			0.00	0.00	11.50	71.49	96.89	113.54	165.92	261	600	600	CONC	0.40	10.0	388.3	1.37	0.12	0.67
Contribution From Obsidian Street, Pipe 227 - 109						7.05				0.00				0.00				0.00	13.42														
	109	110	0.18	0.72	0.36	11.06			0.00	0.00			0.00	0.00			0.00	0.00	13.42	65.78	89.05	104.31	152.38	727	750	750	CONC	0.70	60.0	931.4	2.11	0.47	0.78
Contribution From Focality Crescent, Pipe 108 - 110						1.11				0.00				0.00				0.00	11.32														
			0.16	0.58	0.26	12.42			0.00	0.00			0.00	0.00			0.00	0.00														
			0.19	0.58	0.31	12.73			0.00	0.00			0.00	0.00			0.00	0.00														
	110	111	0.33	0.72	0.66	13.39			0.00	0.00			0.00	0.00			0.00	0.00	13.89	64.52	87.32	102.28	149.40	864	900	900	CONC	0.40	75.0	1144.9	1.80	0.69	0.75
	111	115	0.18	0.72	0.36	13.75			0.00	0.00			0.00	0.00			0.00	0.00	14.58	62.77	84.92	99.46	145.25	863	975	975	CONC	0.20	91.0	1002.2	1.34	1.13	0.86
Contribution From Focality Crescent, Pipe 114 - 115						2.53				0.00				0.00				0.00	13.93														
					0.00	16.28	0.04	0.72	0.08	0.08			0.00	0.00			0.00	0.00														
			0.15	0.58	0.24	16.52			0.00	0.08			0.00	0.00			0.00	0.00														
			0.16	0.58	0.26	16.78			0.00	0.08			0.00	0.00			0.00	0.00														
	115	116	0.19	0.72	0.38	17.16			0.00	0.08			0.00	0.00			0.00	0.00	15.71	60.13	81.32	95.22	139.03	1038	1050	1050	CONC	0.50	59.0	1930.9	2.23	0.44	0.54
To Inselberg Street, Pipe 116 - 117						17.16				0.08				0.00				0.00	16.16														
PARK BLOCK																																
	CTRL MH 4	104			0.00	0.00	1.72	0.40	1.91	1.91			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	199	525	525	CONC	0.40	9.5	272.0	1.26	0.13	0.73
To Chillerton Drive, Pipe 104 - 106						0.00				1.91				0.00				0.00	10.13														
Canadensis Lane																																
			0.01	0.72	0.02	0.02			0.00	0.00			0.00	0.00			0.00	0.00														
			0.03	0.58	0.05	0.07			0.00	0.00			0.00	0.00			0.00	0.00														
			0.04	0.58	0.06	0.13			0.00	0.00			0.00	0.00			0.00	0.00														
			0.16	0.58	0.26	0.39			0.00	0.00			0.00	0.00			0.00	0.00														
	230	231	0.19	0.72	0.38	0.77			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	59	300	300	PVC	2.00	73.5	136.8	1.93	0.63	0.43
			0.12	0.58	0.19	0.96			0.00	0.00			0.00	0.00			0.00	0.00														
			0.21	0.58	0.34	1.30			0.00	0.00			0.00	0.00			0.00	0.00														
	231	103	0.41	0.72	0.82	2.12			0.00	0.00			0.00	0.00			0.00	0.00	10.63	74.46	100.96	118.34	172.97	158	525	525	CONC	2.00	87.0	608.2	2.81	0.52	0.26
To Chillerton Drive, Pipe 103 - 104						2.12				0.00				0.00				0.00	11.15														

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: SLM	PROJECT: **Ciavan Communities - Brazeau Phase 1**		
Checked: ADF	LOCATION: **City of Ottawa**		
Dwg. Reference: Storm Drainage Plan 83-86	File Ref: 18-1030	Date: 22-Apr-20	Sheet No. 3 OF 6

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)														FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
Surface Lane																																	
			0.17	0.58	0.27	0.27			0.00	0.00			0.00	0.00			0.00	0.00															
	228	229	0.31	0.72	0.62	0.89			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	69	300	300	PVC	2.00	74.5	136.8	1.93	0.64	0.50
			0.20	0.58	0.32	1.22			0.00	0.00			0.00	0.00			0.00	0.00															
	229	102	0.39	0.72	0.78	2.00			0.00	0.00			0.00	0.00			0.00	0.00	10.64	74.43	100.92	118.29	172.90	149	525	525	CONC	0.85	86.5	396.5	1.83	0.79	0.37
To Chillerton Drive, Pipe 102 - 103						2.00				0.00				0.00				0.00	11.43														
Chillerton Drive																																	
	101	102			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	2.60	30.5	155.9	2.21	0.23	0.00
Contribution From Surface Lane, Pipe 229 - 102						2.00				0.00				0.00				0.00	11.43														
	102	103	0.13	0.72	0.26	2.26			0.00	0.00			0.00	0.00			0.00	0.00	11.43	71.72	97.21	113.91	166.47	162	525	525	CONC	1.55	59.0	535.4	2.47	0.40	0.30
Contribution From Canadensis Lane, Pipe 231 - 103						2.12				0.00				0.00				0.00	11.15														
	103	104	0.19	0.72	0.38	4.76			0.00	0.00			0.00	0.00			0.00	0.00	11.83	70.44	95.44	111.84	163.43	335	750	750	CONC	0.40	120.0	704.1	1.59	1.25	0.48
From PARK BLOCK - 123, Pipe CTRL MH 4 - 104						0.00				1.91				0.00				0.00	10.13														
	104	106	0.26	0.72	0.52	5.28			0.00	1.91			0.00	0.00			0.00	0.00	13.08	66.70	90.32	105.80	154.56	525	1050	1050	CONC	0.15	41.5	1057.6	1.22	0.57	0.50
To Elevation Road, Pipe 106 - 116						5.28				1.91				0.00				0.00	13.65														
Epoch Street																																	
	221	222	0.09	0.72	0.18	0.18			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	14	300	300	PVC	0.50	77.5	68.4	0.97	1.34	0.20
			0.11	0.58	0.18	0.36			0.00	0.00			0.00	0.00			0.00	0.00															
			0.22	0.72	0.44	0.80			0.00	0.00			0.00	0.00			0.00	0.00															
			0.31	0.54	0.47	1.26			0.00	0.00			0.00	0.00			0.00	0.00															
			0.31	0.58	0.50	1.76			0.00	0.00			0.00	0.00			0.00	0.00															
	222	223	0.40	0.72	0.80	2.56			0.00	0.00			0.00	0.00			0.00	0.00	11.34	72.03	97.63	114.41	167.21	185	600	600	CONC	0.15	95.5	237.8	0.84	1.89	0.78
			0.00		0.00	2.56	0.07	0.71	0.14	0.14			0.00	0.00			0.00	0.00															
	223	224	0.13	0.72	0.26	2.82			0.00	0.14			0.00	0.00			0.00	0.00	13.23	66.29	89.76	105.15	153.60	200	600	600	CONC	0.20	97.0	274.6	0.97	1.66	0.73
To Elevation Road, Pipe 224 - 105						2.82				0.14				0.00				0.00	14.89														
Eminence Street																																	
			0.09	0.54	0.14	0.14			0.00	0.00			0.00	0.00			0.00	0.00															
			0.11	0.54	0.17	0.30			0.00	0.00			0.00	0.00			0.00	0.00															
	216	217	0.39	0.71	0.77	1.07			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	82	375	375	PVC	0.60	75.5	135.8	1.23	1.02	0.61
			0.25	0.54	0.38	1.45			0.00	0.00			0.00	0.00			0.00	0.00															
			0.32	0.54	0.48	1.93			0.00	0.00			0.00	0.00			0.00	0.00															
	217	218	0.46	0.71	0.91	2.83			0.00	0.00			0.00	0.00			0.00	0.00	11.02	73.09	99.08	116.12	169.72	207	600	600	CONC	0.20	113.0	274.6	0.97	1.94	0.75
			0.00		0.00	2.83	0.04	0.71	0.08	0.08			0.00	0.00			0.00	0.00															
	218	220	0.10	0.71	0.20	3.03			0.00	0.08			0.00	0.00			0.00	0.00	12.96	67.04	90.78	106.34	155.36	210	600	600	CONC	0.20	80.5	274.6	0.97	1.38	0.77
To Elevation Road, Pipe 220 - 224						3.03				0.08				0.00				0.00	14.34														
Elevation Road																																	
					0.00	0.00																											
	Plug East	310	1.22	0.65	2.20	2.20			0.00	0.00			0.00	0.00			0.00	0.00	14.71	62.46	84.51	98.97	144.53	138	750	750	CONC	0.20	9.5	497.9	1.13	0.14	0.28
To Elevation Road, Pipe 310 - 311						2.20				0.00				0.00				0.00	14.85														
					0.00	0.00	2.56	0.65	0.00	0.00			0.00	0.00			0.00	0.00	16.00														
			5.09	0.65	0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	16.00														
	Plug South	310			9.20	9.20			4.63	4.63			0.00	0.00			0.00	0.00	16.00	59.50	80.46	94.21	137.55	919	1050	1050	CONC	0.15	17.5	1057.6	1.22	0.24	0.87
To Elevation Road, Pipe 310 - 311						9.20				4.63				0.00				0.00	16.24														
	219	220			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	2.65	25.0	157.4	2.23	0.19	0.00
Contribution From Eminence Street, Pipe 218 - 220						3.03				0.08				0.00				0.00	14.34														
					0.00	3.03	0.05	0.71	0.10	0.18			0.00	0.00			0.00	0.00															
			0.06	0.71	0.12	3.15			0.00	0.18			0.00	0.00			0.00	0.00															
	220	224			0.00	3.15	0.12	0.71	0.24	0.41			0.00	0.00			0.00	0.00	14.34	63.36	85.74	100.42	146.66	235	600	600	CONC	1.90	59.0	846.4	2.99	0.33	0.28

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: SLM	PROJECT: **Ciavan Communities - Brazeau Phase 1**	
Checked: ADF	LOCATION: **City of Ottawa**	
Dwg. Reference: Storm Drainage Plan 83-86	File Ref: 18-1030	Date: 22-Apr-20 / Sheet No. 4 OF 6

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)												FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
Contribution From Epoch Street, Pipe 223 - 224						2.82				0.14				0.00				0.00	14.89														
					0.00	5.97	0.03	0.58	0.05	0.60			0.00	0.00			0.00	0.00															
			0.06	0.71	0.12	6.09			0.00	0.60			0.00	0.00			0.00	0.00															
			0.11	0.54	0.17	6.26			0.00	0.60			0.00	0.00			0.00	0.00															
	224	105			0.00	6.26	0.16	0.71	0.32	0.92			0.00	0.00			0.00	0.00	14.89	62.02	83.91	98.26	143.50	465	600	600	CONC	1.90	82.0	846.4	2.99	0.46	0.55
	105	106			0.00	6.26	0.35	0.71	0.69	1.61			0.00	0.00			0.00	0.00	15.35	60.96	82.45	96.55	140.98	514	675	675	CONC	1.40	91.0	994.6	2.78	0.55	0.52
Contribution From Chillerton Drive, Pipe 104 - 106						5.28				1.91				0.00				0.00	13.65														
			0.20	0.58	0.32	11.86			0.00	3.52			0.00	0.00			0.00	0.00															
					0.00	11.86	0.21	0.72	0.42	3.94			0.00	0.00			0.00	0.00															
	106	116			0.00	11.86	0.22	0.71	0.43	4.37			0.00	0.00			0.00	0.00	15.89	59.73	80.77	94.58	138.09	1062	1350	1350	CONC	0.20	122.5	2387.0	1.67	1.22	0.44
To Haiku Street, Pipe 116 - 117						11.86				4.37				0.00				0.00	17.12														
Haiku Street																																	
Contribution From Elevation Road, Pipe 106 - 116						11.86				4.37				0.00				0.00	17.12														
Contribution From Haiku Street, Pipe 115 - 116						17.16				0.08				0.00				0.00	16.16														
					0.00	29.02	0.04	0.71	0.08	4.53			0.00	0.00			0.00	0.00															
			0.13	0.54	0.20	29.21			0.00	4.53			0.00	0.00			0.00	0.00															
			0.13	0.54	0.20	29.41			0.00	4.53			0.00	0.00			0.00	0.00															
			0.29	0.54	0.44	29.85			0.00	4.53			0.00	0.00			0.00	0.00															
	116	117	0.31	0.71	0.61	30.46			0.00	4.53			0.00	0.00			0.00	0.00	17.12	57.18	77.28	90.47	132.07	2092	1650	1650	CONC	0.10	122.5	2882.2	1.35	1.51	0.73
			0.15	0.54	0.23	30.68			0.00	4.53			0.00	0.00			0.00	0.00															
			0.16	0.54	0.24	30.92			0.00	4.53			0.00	0.00			0.00	0.00															
	117	118	0.49	0.71	0.97	31.89			0.00	4.53			0.00	0.00			0.00	0.00	18.63	54.34	73.40	85.91	125.38	2066	1650	1650	CONC	0.10	121.0	2882.2	1.35	1.50	0.72
	118	136			0.00	31.89			0.00	4.53			0.00	0.00			0.00	0.00	20.13	51.82	69.97	81.88	119.46	1970	1950	1950	CONC	0.10	11.0	4499.9	1.51	0.12	0.44
To Expansion Road, Pipe 136 - 302						31.89				4.53				0.00				0.00	20.25														
Expansion Road																																	
Contribution From Elevation Road, Plug East - 310						2.20				0.00				0.00				0.00	14.85														
Contribution From Elevation Road, Plug South - 310						9.20				4.63				0.00				0.00	16.24														
					0.00	11.40	0.06	0.54	0.09	4.72			0.00	0.00			0.00	0.00															
			0.09	0.54	0.14	11.54			0.00	4.72			0.00	0.00			0.00	0.00															
			0.16	0.71	0.32	11.85			0.00	4.72			0.00	0.00			0.00	0.00															
	310	311	0.16	0.71	0.32	12.17			0.00	4.72			0.00	0.00			0.00	0.00	16.24	58.99	79.76	93.38	136.34	1094	1200	1200	CONC	0.15	62.5	1510.0	1.34	0.78	0.72
			0.21	0.54	0.32	12.48			0.00	4.72			0.00	0.00			0.00	0.00															
	311	3111TEE	0.25	0.71	0.49	12.98			0.00	4.72			0.00	0.00			0.00	0.00	17.02	57.38	77.56	90.79	132.54	1110	1200	1200	CONC	0.15	72.0	1510.0	1.34	0.90	0.74
	3111TEE	312			0.00	12.98			0.00	4.72			0.00	0.00			0.00	0.00	17.92	55.64	75.18	88.00	128.44	1077	1200	1200	CONC	0.15	76.5	1510.0	1.34	0.95	0.71
	312	313	0.06	0.54	0.09	13.07			0.00	4.72			0.00	0.00			0.00	0.00	18.87	53.92	72.83	85.24	124.39	1048	1200	1200	CONC	0.15	21.5	1510.0	1.34	0.27	0.69
To POND INLET - 120, Pipe 313 - 500						13.07				4.72				0.00				0.00	19.14														
Contribution From Haiku Street, Pipe 118 - 136						31.89				4.53				0.00				0.00	20.25														
Contribution From Travertine Way, Pipe 132 - 136						17.85				0.06				0.00				0.00	18.52														
Contribution From Haiku Street, Pipe 135 - 136						17.38				0.00				0.00				0.00	14.46														
	136	302	0.03	0.54	0.05	67.17			0.00	4.59			0.00	0.00			0.00	0.00	20.25	51.63	69.70	81.57	119.01	3998	2250	2250	CONC	0.10	54.0	6590.6	1.66	0.54	0.61
From FUTURE ROAD (DRUMMOND LAND) - Plug - 302						1.79				0.00				0.00				0.00	10.20														
			0.06	0.54	0.09	69.05			0.00	4.59			0.00	0.00			0.00	0.00															
	302	303	0.16	0.71	0.32	69.36			0.00	4.59			0.00	0.00			0.00	0.00	20.79	50.79	68.55	80.22	117.03	4048	2250	2250	CONC	0.10	59.0	6590.6	1.66	0.59	0.61
From FUTURE ROAD (DRUMMOND LAND) - Plug - 303						1.81				1.61				0.00				0.00	15.29														
			0.09	0.54	0.14	71.30			0.00	6.21			0.00	0.00			0.00	0.00															
	303	304	0.22	0.71	0.43	71.74			0.00	6.21			0.00	0.00			0.00	0.00	21.39	49.90	67.35	78.80	114.95	4208	2250	2250	CONC	0.10	134.5	6590.6	1.66	1.35	0.64
From FUTURE ROAD (DRUMMOND LAND) - Plug - 304						2.17				0.00				0.00				0.00	10.17														
			0.10	0.54	0.15	74.06			0.00	6.21			0.00	0.00			0.00	0.00															
	304	306TEE	0.28	0.71	0.55	74.61			0.00	6.21			0.00	0.00			0.00	0.00	22.74	48.00	64.76	75.76	110.49	4194	2250	2250	CONC	0.10	42.5	6590.6	1.66	0.43	0.64
POND INLET - 120, Pipe 306TEE - 307TEE						74.61				6.21				0.00				0.00	23.17														
POND INLET																																	
Contribution From Expansion Road, Pipe 312 - 313						13.07				4.72				0.00				0.00	19.14														
	313	500			0.00	13.07			0.00	4.72			0.00	0.00			0.00	0.00	19.14	53.46	72.19	84.49	123.30	1039	2250	2250	CONC	0.10	33.5	6590.6	1.66	0.34	0.16
	500	HW501			0.00	13.07			0.00	4.72			0.00	0.00			0.00	0.00	19.48	52.89	71.42	83.58	121.96	1028	2250	2250	CONC	0.10	5.0	6590.6	1.66	0.05	0.16

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: SLM	PROJECT: **Ciavan Communities - Brazeau Phase 1**	
Checked: ADF	LOCATION: **City of Ottawa**	
Dwg. Reference: Storm Drainage Plan 83-86	File Ref: 18-1030	Date: 22-Apr-20	Sheet No. 5 OF 6

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)												FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year									FLOW	
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	(min)	Q/Q full
Contribution From Expansion Road, Pipe 305TEE - 306TEE						74.61				6.21				0.00				0.00	23.17														
	306TEE	307	0.18	0.71	0.36	74.96			0.00	6.21			0.00	0.00			0.00	0.00	23.17	47.44	63.99	74.85	109.17	4164	2250	2250	CONC	0.10	13.0	6590.6	1.66	0.13	0.63
	307	400			0.00	74.96			0.00	6.21			0.00	0.00			0.00	0.00	23.30	47.27	63.76	74.58	108.77	4149	2250	2250	CONC	0.10	23.5	6590.6	1.66	0.24	0.63
	400	HW401			0.00	74.96			0.00	6.21			0.00	0.00			0.00	0.00	23.53	46.96	63.34	74.09	108.05	4124	2250	2250	CONC	0.10	15.5	6590.6	1.66	0.16	0.63
POND OUTLET - CONSTANT FLOW RATE 1300 L/S																																	
			0.00	0.00	0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00						1300									
	HW OUT	1002			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	1300	900	900	CONC	0.60	7.5	1402.3	2.20	0.06	0.93
	1002	1003			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.06	76.59	103.89	121.79	178.04	1300	900	900	CONC	0.60	28.0	1402.3	2.20	0.21	0.93
To BORRISOKANE - 190, Pipe 1003 - 1004						0.00				0.00				0.00				0.00	10.27					1300									
BORRISOKANE ROAD - CONSTANT FLOW RATE 1300 L/S																																	
Contribution From POND OUTLET - 192, Pipe 1002 - 1003						0.00				0.00				0.00				0.00	10.27					1300									
	1003	1004			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	10.27	75.79	102.80	120.50	176.14	1300	900	900	CONC	0.60	108.5	1402.3	2.20	0.82	0.93
	1004	1005			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	11.09	72.86	98.77	115.76	169.18	1300	975	975	CONC	0.40	106.0	1417.4	1.90	0.93	0.92
	1005	1006			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	12.02	69.83	94.61	110.86	161.99	1300	1200	1200	CONC	0.20	106.0	1743.6	1.54	1.15	0.75
	1006	1007			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	13.17	66.47	89.99	105.42	154.01	1300	1200	1200	CONC	0.20	106.0	1743.6	1.54	1.15	0.75
	1007	1008			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	14.31	63.44	85.85	100.55	146.85	1300	1200	1200	CONC	0.20	88.0	1743.6	1.54	0.95	0.75
	1008	HW1009			0.00	0.00			0.00	0.00			0.00	0.00			0.00	0.00	15.26	61.15	82.72	96.86	141.45	1300	1200	1200	CONC	0.20	14.5	1743.6	1.54	0.16	0.75

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Checked: ADF	LOCATION: **City of Ottawa**		
Dwg. Reference: Storm Drainage Plan 83-86	File Ref: 18-1030	Date: 22-Apr-20	Sheet No. 6 OF 6