

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+H		INFILTRATION			PIPE					
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.		
						AREA (ha)	POP.																	(FULL) (m/s)	(ACT.) (m/s)	
	16A	17A	0.67		70	0.67	70	3.6	0.82		0.00		0.00	0.00	0.00	0.67	0.67	0.19	1.01	95.5	200	0.35	19.40	0.05	0.62	0.33
	17A	19A				0.67	70	3.6	0.82		0.00		0.00	0.00	0.00	0.67	0.67	0.19	1.01	13.0	200	0.35	19.40	0.05	0.62	0.33
To , Pipe 19A - 20A						0.67	70				0.00		0.00			0.67										
	1A	2A	0.14		15	0.14	15	3.7	0.18		0.00		0.00	0.00	0.14	0.14	0.04	0.22	28.5	200	0.65	26.44	0.01	0.84	0.24	
	2A	3A	0.49		51	0.63	66	3.6	0.78		0.00		0.00	0.00	0.49	0.63	0.18	0.96	87.5	200	0.35	19.40	0.05	0.62	0.32	
To , Pipe 3A - 4A						0.63	66				0.00		0.00			0.63										
Contribution From , Pipe 2A - 3A						0.63	66				0.00		0.00		0.63	0.63										
	3A	4A	0.74		62	1.37	128	3.6	1.48		0.00		0.00	0.00	0.74	1.37	0.39	1.87	127.0	200	0.35	19.40	0.10	0.62	0.39	
	4A	5A	0.74		62	2.11	190	3.5	2.17		0.00		0.00	0.00	0.74	2.11	0.60	2.77	124.0	200	0.35	19.40	0.14	0.62	0.44	
	5A	6A	0.24		20	2.35	210	3.5	2.39		0.00		0.00	0.00	0.24	2.35	0.67	3.06	42.5	200	0.35	19.40	0.16	0.62	0.45	
	6A	7A	0.16		14	2.51	224	3.5	2.54		0.00		0.00	0.00	0.16	2.51	0.72	3.26	27.0	200	0.35	19.40	0.17	0.62	0.46	
	7A	8A	0.25		21	2.76	245	3.5	2.77		0.00		0.00	0.00	0.25	2.76	0.79	3.56	43.5	200	0.35	19.40	0.18	0.62	0.47	
	8A	10A	0.11		10	2.87	255	3.5	2.88		0.00		0.00	0.00	0.11	2.87	0.82	3.70	26.0	200	0.35	19.40	0.19	0.62	0.47	
To , Pipe 10A - 11A						2.87	255				0.00		0.00			2.87										
Contribution From , Pipe 17A - 19A						0.67	70				0.00		0.00		0.67	0.67										
Contribution From , Pipe 18A - 19A						2.59	395				0.00		0.00		2.59	3.26										
	19A	20A	0.59		49	3.85	514	3.4	5.62		0.00		0.00	0.00	0.59	3.85	1.10	6.72	130.5	250	0.25	29.73	0.23	0.61	0.49	
	20A	21A	0.41		35	4.26	549	3.4	5.98		0.00		0.00	0.00	0.41	4.26	1.22	7.20	98.0	250	0.25	29.73	0.24	0.61	0.50	
To , Pipe 21A - 22A						4.26	549				0.00		0.00			4.26										
			0.68		71	0.68	71				0.00		0.00		0.68	0.68										
	9A	10A	2.04		170	2.72	241	3.5	2.73		0.00		0.00	0.00	2.04	2.72	0.78	3.51	64.5	200	0.35	19.40	0.18	0.62	0.47	
Contribution From , Pipe 8A - 10A						2.87	255				0.00		0.00		2.87	5.59										
	10A	11A	0.08		0	5.67	496	3.4	5.43		0.00		0.00	0.00	0.08	5.67	1.62	7.06	13.5	250	0.25	29.73	0.24	0.61	0.50	
	11A	12A				5.67	496	3.4	5.43		0.00		0.00	0.00	0.00	5.67	1.62	7.06	11.0	250	0.25	29.73	0.24	0.61	0.50	
	12A	13A	0.07		6	5.74	502	3.4	5.50		0.00		0.00	0.00	0.07	5.74	1.64	7.14	51.5	250	0.25	29.73	0.24	0.61	0.50	
	13A	14A	0.59		49	6.33	551	3.4	6.00		0.00		0.00	0.00	0.59	6.33	1.81	7.81	52.5	250	0.25	29.73	0.26	0.61	0.51	
	14A	15A	0.05		5	6.38	556	3.4	6.05		0.00		0.00	0.00	0.05	6.38	1.82	7.88	10.0	250	0.25	29.73	0.26	0.61	0.51	
	15A	23A	0.48		40	6.86	596	3.3	6.46		0.00		0.00	0.00	0.48	6.86	1.96	8.43	87.5	250	0.25	29.73	0.28	0.61	0.52	
To , Pipe 23A - 24A						6.86	596				0.00		0.00			6.86										
	30A	31A	0.39		33	0.39	33	3.7	0.39		0.00		0.00	0.00	0.39	0.39	0.11	0.50	44.0	200	0.65	26.44	0.02	0.84	0.33	
			0.42		35	0.81	68				0.00		0.00	0.00	0.42	0.81										
	31A	32A	0.43		45	1.24	113	3.6	1.31		0.00		0.00	0.00	0.43	1.24	0.35	1.67	142.5	200	0.35	19.40	0.09	0.62	0.37	
	32A	33A	0.09		8	1.33	121	3.6	1.40		0.00		0.00	0.00	0.09	1.33	0.38	1.78	16.0	200	0.35	19.40	0.09	0.62	0.38	
	33A	34A	0.08		0	1.41	121	3.6	1.40		0.00		0.00	0.00	0.08	1.41	0.40	1.81	49.5	200	0.35	19.40	0.09	0.62	0.39	
			0.16		14	1.57	135				0.00		0.00	0.00	0.16	1.57										
	34A	35A	1.04		109	2.61	244	3.5	2.76		0.00		0.00	0.00	1.04	2.61	0.75	3.51	59.5	200	0.35	19.40	0.18	0.62	0.47	
			0.12		10	2.73	254				0.00		0.00	0.00	0.12	2.73										
	35A	36A	0.86		90	3.59	344	3.4	3.84		0.00		0.00	0.00	0.86	3.59	1.03	4.86	60.5	200	0.35	19.40	0.25	0.62	0.51	

DESIGN PARAMETERS										Designed: WL					PROJECT: BARRHAVEN CONSERVANCY WEST									
Park Flow = 9300 L/ha/da Average Daily Flow = 280 l/p/day Comm/Inst Flow = 28000 L/ha/da Industrial Flow = 35000 L/ha/da Max Res. Peak Factor = 4.00 Commercial/Inst./Park Peak Factor = 1.00 Institutional = 0.32 l/s/ha										Industrial Peak Factor = as per MOE Graph Extraneous Flow = 0.286 L/s/ha Minimum Velocity = 0.600 m/s Manning's n = (Conc) 0.013 (Pvc) 0.013 Townhouse coeff= 2.7 Single house coeff= 3.4					Checked: WL					LOCATION: City of Ottawa				
										Dwg. Reference: Sanitary Tributary Area					File Ref: 20-1226		Date: 14 Mar 2024		Sheet No. 1 of 4					

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION						COMM		INSTIT		PARK		C+H	INFILTRATION			PIPE																				
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.													
						AREA (ha)	POP.																			(FULL) (m/s)	(ACT.) (m/s)												
			0.35		37	3.94	381				0.00		0.00		0.00		0.35	3.94																					
	36A	37A	0.98		82	4.92	463	3.4	5.09		0.00		0.00		0.00		0.98	4.92	1.41	6.50	42.5	200	0.35	19.40	0.33	0.62	0.55												
To , Pipe 37A - 38A						4.92	463				0.00		0.00		0.00		4.92	4.92																					
Contribution From , Pipe 36A - 37A						4.92	463				0.00		0.00		0.00		4.92	4.92																					
	37A	38A	0.54		45	5.46	508	3.4	5.56		0.00		0.00		0.00		0.54	5.46	1.56	7.12	66.0	200	0.35	19.40	0.37	0.62	0.57												
	38A	39A	0.45		38	5.91	546	3.4	5.95		0.00		0.00		0.00		0.45	5.91	1.69	7.64	66.0	200	0.35	19.40	0.39	0.62	0.58												
			0.34		36	6.25	582				0.00		0.00		0.00		0.34	6.25																					
			0.41		35	6.66	617				0.00		0.00		0.00		0.41	6.66																					
	39A	44A	2.89		521	9.55	1138	3.2	11.84		0.00		0.00		0.00		2.89	9.55	2.73	14.57	69.5	200	0.35	19.40	0.75	0.62	0.68												
Contribution From , Pipe 43A - 44A						1.05	0				0.00		0.00		0.00		1.05	10.60																					
	44A	45A	0.36		38	10.96	1176	3.2	12.21		0.00		0.00		0.00		0.36	10.96	3.13	15.34	107.0	250	0.25	29.73	0.52	0.61	0.61												
To , Pipe 45A - 46A						10.96	1176				0.00		0.00		0.00		10.96	10.96																					
			0.18		0	0.18	0				0.00		0.00		0.00		0.18	0.18																					
	118A	119A	0.96		173	1.14	173	3.5	1.98		0.00		0.00		0.00		0.96	1.14	0.33	2.31	37.5	200	0.65	26.44	0.09	0.84	0.51												
To , Pipe 119A - 120A						1.14	173				0.00		0.00		0.00		1.14	1.14																					
			0.40		0	0.40	0				0.00		0.00		0.00		0.40	0.40																					
	18A	19A	2.19		395	2.59	395	3.4	4.38		0.00		0.00		0.00		2.19	2.59	0.74	5.12	98.5	200	0.65	26.44	0.19	0.84	0.65												
To , Pipe 19A - 20A						2.59	395				0.00		0.00		0.00		2.59	2.59																					
	101A	102A	0.45		47	0.45	47	3.7	0.56		0.00		0.00		0.00		0.45	0.45	0.13	0.69	74.0	200	0.65	26.44	0.03	0.84	0.36												
	102A	103A	0.41		43	0.86	90	3.6	1.05		0.00		0.00		0.00		0.41	0.86	0.25	1.30	77.0	250	0.25	29.73	0.04	0.61	0.30												
To , Pipe 103A - 104A						0.86	90				0.00		0.00		0.00		0.86	0.86																					
	40A	41A	0.56		0	0.56	0				0.00		0.00		0.00		0.56	0.56	0.16	0.16	92.0	200	0.65	26.44	0.01	0.84	0.23												
	41A	42A	0.30		0	0.86	0				0.00		0.00		0.00		0.30	0.86	0.25	0.25	92.0	250	0.25	29.73	0.01	0.61	0.18												
	42A	43A	0.14		0	1.00	0				0.00		0.00		0.00		0.14	1.00	0.29	0.29	43.0	250	0.25	29.73	0.01	0.61	0.18												
	43A	44A	0.05		0	1.05	0				0.00		0.00		0.00		0.05	1.05	0.30	0.30	20.5	250	0.25	29.73	0.01	0.61	0.19												
To , Pipe 44A - 45A						1.05	0				0.00		0.00		0.00		1.05	1.05																					
EMERGENCY PUMP STATION OVERFLOW						31.53	3401				0.00		0.00		2.56		34.09	34.09																					
	107A	108A	0.20		21	31.73	3422	2.9	32.32		0.00		0.00		2.56		0.20	34.29	9.81	42.40	28.0	525	0.10	136.00	0.31	0.63	0.55												
Contribution From , Pipe 106A - 108A						2.09	211				0.00		0.00		0.46		2.55	36.84																					
	108A	114A	0.50		52	34.32	3685	2.9	34.54		0.00		0.00	3.02	0.33	0.50	37.34	10.68	45.54	83.5	525	0.10	136.00	0.33	0.63	0.56													
Contribution From , Pipe 113A - 114A						1.28	108				0.00		0.00		0.00		1.28	38.62																					
	114A	115A	0.22		23	35.82	3816	2.9	35.63		0.00		0.00	3.02	0.33	0.22	38.84	11.11	47.06	60.0	525	0.10	136.00	0.35	0.63	0.57													
Contribution From , Pipe 1270A - 115A						0.89	94				0.00		0.00		0.00		0.89	39.73																					
	115A	117A	0.52		55	37.23	3965	2.9	36.87		0.00		0.00	3.02	0.33	0.52	40.25	11.51	48.71	60.0	525	0.10	136.00	0.36	0.63	0.57													
Contribution From , Pipe 127A - 117A						0.98	103				0.00		0.00		0.00		0.98	41.23																					
			0.10		0	38.31	4068				0.00		0.00	3.02		0.10	41.33																						
	117A	124A	2.49		449	40.80	4517	2.8	41.40		0.00		0.00	3.02	0.33	2.49	43.82	12.53	54.26	60.0	525	0.10	136.00	0.40	0.63	0.59													

DESIGN PARAMETERS										Designed:		PROJECT:									
Park Flow =	9300	L/ha/da	0.10764	I/s/ha						WL		BARRHAVEN CONSERVANCY WEST									
Average Daily Flow =	280	I/p/day																			
Comm/Inst Flow =	28000	L/ha/da	0.3241	I/s/ha	Industrial Peak Factor = as per MOE Graph																
Industrial Flow =	35000	L/ha/da	0.40509	I/s/ha	Extraneous Flow =	0.286	L/s/ha														
Max Res. Peak Factor =	4.00				Minimum Velocity =	0.600	m/s														
Commercial/Inst./Park Peak Factor =	1.00				Manning's n = (Conc)	0.013	(Pvc)	0.013													
Institutional =	0.32	I/s/ha			Townhouse coeff=	2.7															
					Single house coeff=	3.4															
										Dwg. Reference:	Sanitary Tributary Area	File Ref:	20-1226	Date:	14 Mar 2024	Sheet No.	2	of	4		

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

LOCATION		RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+H		INFILTRATION			PIPE							
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.	
						AREA (ha)	POP.																			(FULL) (m/s)	(ACT.) (m/s)
	116A	127A	0.46		48	0.46	48	3.7	0.57		0.00		0.00		0.00	0.46	0.46	0.13	0.70	49.0	200	0.65	26.44	0.03	0.84	0.36	
	127A	117A	0.52		55	0.98	103	3.6	1.20		0.00		0.00		0.00	0.52	0.98	0.28	1.48	95.0	250	0.25	29.73	0.05	0.61	0.31	
To , Pipe 117A - 124A						0.98	103				0.00		0.00				0.98										
	122A	123A	0.44		46	0.44	46	3.7	0.55		0.00		0.00		0.00	0.44	0.44	0.13	0.67	61.0	200	0.65	26.44	0.03	0.84	0.35	
	123A	124A	0.65		68	1.09	114	3.6	1.32		0.00		0.00		0.00	0.65	1.09	0.31	1.64	111.5	250	0.25	29.73	0.05	0.61	0.32	
To , Pipe 124A - 125A						1.09	114				0.00		0.00				1.09										
Contribution From , Pipe 118A - 119A						1.14	173				0.00		0.00			1.14	1.14										
	119A	120A	0.24		0	1.38	173	3.5	1.98		0.00		0.00		0.00	0.24	1.38	0.39	2.38	24.5	250	0.25	29.73	0.08	0.61	0.36	
	120A	121A	0.38		40	1.76	213	3.5	2.42		0.00		0.00		0.00	0.38	1.76	0.50	2.93	85.5	250	0.25	29.73	0.10	0.61	0.38	
	121A	124A	0.32		34	2.08	247	3.5	2.79		0.00		0.00		0.00	0.32	2.08	0.59	3.39	86.0	250	0.25	29.73	0.11	0.61	0.40	
To , Pipe 124A - 125A						2.08	247				0.00		0.00				2.08										
Contribution From , Pipe 47A - 48A						31.53	3401				0.00		0.00		2.56	34.09	34.09										
	48A	49A				31.53	3401	2.9	32.14		0.00		0.00	2.56	0.28	0.00	34.09	9.75	42.17	16.0	375	0.15	67.91	0.62	0.61	0.65	

DESIGN PARAMETERS										Designed: WL					PROJECT: BARRHAVEN CONSERVANCY WEST														
Park Flow = 9300 L/ha/da 0.10764 l/s/ha Average Daily Flow = 280 l/p/day Comm/Inst Flow = 28000 L/ha/da 0.3241 l/s/ha Industrial Flow = 35000 L/ha/da 0.40509 l/s/ha Max Res. Peak Factor = 4.00 Commercial/Inst./Park Peak Factor = 1.00 Institutional = 0.32 l/s/ha										Industrial Peak Factor = as per MOE Graph Extraneous Flow = 0.286 L/s/ha Minimum Velocity = 0.600 m/s Manning's n = (Conc) 0.013 (Pvc) 0.013 Townhouse coeff= 2.7 Single house coeff= 3.4					Checked: WL					LOCATION: City of Ottawa									
										Dwg. Reference: Sanitary Tributary Area					File Ref: 20-1226					Date: 14 Mar 2024					Sheet No. 4 of 4				