

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Manning 0.013
Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
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	INV	OBV	T/G	CAPACITY	VELOCITY	TIME OF	RATIO	
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	UPS	UPS	UPS	(l/s)	(m/s)	LOW (min)	Q/Q full	
STREET 11																																					
	135	136	0.22	0.68	0.42	0.42			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	32	300	300	PVC	0.35	53.5	103.626	103.926	106.426	57.2089	0.8093	1.1017	0.558	
To STREET 10, Pipe 136 - 137						0.42				0.00				0.00				0.00	11.10																		
	129	130	0.58	0.68	1.10	1.10			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	84	450	450	CONC	0.20	77.5	103.453	103.903	106.405	127.5033	0.8017	1.6112	0.660	
	130	131	0.45	0.68	0.85	1.95			0.00	0.00			0.00	0.00			0.00	0.00	11.61	71.13	96.39	112.95	165.06	138	525	525	CONC	0.20	81.5	103.223	103.748	106.249	192.3297	0.8885	1.5289	0.720	
To STREET 12, Pipe 131 - 141						1.95				0.00				0.00				0.00	13.14																		
STREET 10																																					
			0.03	0.68	0.06	0.06			0.00	0.00			0.00	0.00			0.00	0.00																			
	126	127	0.71	0.68	1.34	1.40			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	107	450	450	CONC	0.25	108.5	103.639	104.089	106.645	142.5531	0.8963	2.0175	0.754	
	127	128	0.64	0.68	1.21	2.61			0.00	0.00			0.00	0.00			0.00	0.00	12.02	69.84	94.62	110.87	162.00	182	600	600	CONC	0.15	112.0	103.218	103.818	106.431	237.8056	0.8411	2.2194	0.766	
To STREET 3, Pipe 128 - 131						2.61				0.00				0.00				0.00	14.24																		
	132	133	0.65	0.68	1.23	1.23			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	94	450	450	CONC	0.20	101.0	103.726	104.176	106.676	127.5033	0.8017	2.0997	0.740	
	133	134	0.14	0.68	0.26	1.49			0.00	0.00			0.00	0.00			0.00	0.00	12.10	69.58	94.27	110.46	161.40	104	450	450	CONC	0.25	13.0	103.494	103.944	106.509	142.5531	0.8963	0.2417	0.729	
	134	136	0.21	0.68	0.40	1.89			0.00	0.00			0.00	0.00			0.00	0.00	12.34	68.85	93.26	109.27	159.66	130	525	525	CONC	0.20	56.0	103.386	103.911	106.488	192.3297	0.8885	1.0505	0.677	
Contribution From STREET 11, Pipe 135 - 136						0.42				0.00				0.00				0.00	11.10																		
	136	137	0.47	0.68	0.89	3.19			0.00	0.00			0.00	0.00			0.00	0.00	13.39	65.84	89.14	104.42	152.53	210	600	600	CONC	0.20	81.0	103.139	103.739	106.379	274.5943	0.9712	1.3901	0.766	
	137	140	0.47	0.68	0.89	4.08			0.00	0.00			0.00	0.00			0.00	0.00	14.78	62.29	84.27	98.69	144.12	254	675	675	CONC	0.20	86.5	102.902	103.577	106.216	375.9224	1.0505	1.3723	0.677	
To STREET 12, Pipe 140 - 141						4.08				0.00				0.00				0.00	16.15																		
STREET 7																																					
	122	123	0.29	0.68	0.55	0.55			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	0.35	50.5	103.951	104.251	106.752	57.2089	0.8093	1.0399	0.736	
To STREET 6, Pipe 123 - 124						0.55				0.00				0.00				0.00	11.04																		
	116	117	0.50	0.68	0.95	0.95			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	73	375	375	PVC	0.30	74.0	103.878	104.253	106.753	96.0323	0.8695	1.4185	0.756	
	117	118	0.44	0.68	0.83	1.78			0.00	0.00			0.00	0.00			0.00	0.00	11.42	71.76	97.25	113.97	166.55	128	525	525	CONC	0.20	79.0	103.506	104.031	106.606	192.3297	0.8885	1.4820	0.663	
To STREET 3, Pipe 118 - 125						1.78				0.00				0.00				0.00	12.90																		
STREET 6																																					
	113	114	0.67	0.68	1.27	1.27			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	97	450	450	CONC	0.20	110.0	104.095	104.545	108.186	127.5033	0.8017	2.2868	0.763	
	114	115	0.62	0.68	1.17	2.44			0.00	0.00			0.00	0.00			0.00	0.00	12.29	69.01	93.49	109.54	160.05	168	600	600	CONC	0.20	110.0	103.725	104.325	106.827	274.5943	0.9712	1.8877	0.613	
To STREET 3, Pipe 115 - 118						2.44				0.00				0.00				0.00	14.17																		
	119	120	0.74	0.68	1.40	1.40			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	107	375	375	PVC	0.65	106.5	105.521	105.896	108.396	141.3557	1.2799	1.3869	0.760	
	120	121	0.14	0.68	0.26	1.66			0.00	0.00			0.00	0.00			0.00	0.00	11.39	71.86	97.40	114.14	166.80	120	375	375	PVC	0.90	13.0	104.799	105.174	107.745	166.3328	1.5060	0.1439	0.719	
	121	123	0.18	0.68	0.34	2.00			0.00	0.00			0.00	0.00			0.00	0.00	11.53	71.39	96.75	113.37	165.68	143	375	375	PVC	1.70	52.5	104.652	105.027	107.560	228.6025	2.0698	0.4227	0.626	
Contribution From STREET 7, Pipe 122 - 123						0.55				0.00				0.00				0.00	11.04																		
	123	124	0.46	0.68	0.87	3.42			0.00	0.00			0.00	0.00			0.00	0.00	11.95	70.04	94.89	111.19	162.48	240	675	675	CONC	0.15	81.0	103.399	104.074	106.681	325.5584	0.9098	1.4839	0.736	
	124	125	0.48	0.68	0.91	4.33			0.00	0.00			0.00	0.00			0.00	0.00	13.44	65.72	88.97	104.22	152.24	285	750	750	CONC	0.15	86.0	103.202	103.952	106.499	431.1703	0.9760	1.4686	0.660	
To STREET 3, Pipe 125 - 128						4.33				0.00				0.00				0.00	14.91																		
STREET 2																																					
	109	110	0.22	0.68	0.42	0.42			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	32	300	300	PVC	0.35	50.5	104.521	104.821	107.160	57.2089	0.8093	1.0399	0.558	
To STREET 1, Pipe 110 - 111						0.42				0.00				0.00				0.00	11.04																		
	103	104	0.58	0.68	1.10	1.10			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	84	450	450	CONC	0.20	75.5	104.209	104.659	107.160	127.5033	0.8017	1.5696	0.660	
	104	105	0.45	0.68	0.85	1.95			0.00	0.00			0.00	0.00			0.00	0.00	11.57	71.26	96.57	113.17	165.38	139	525	525	CONC	0.20	81.0	103.983	104.508	107.009	192.3297	0.8885	1.5195	0.721	
To STREET 3, Pipe 105 - 112						1.95				0.00				0.00				0.00	13.09																		
STREET 1																																					
	100	101	0.57	0.68	1.08	1.08			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	83	450	450	CONC	0.20	108.5	106.217	106.667	109.167	127.5033	0.8017	2.2557		

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Manning		0.013																																		
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	INV	OBV	T/G	CAPACITY	VELOCITY	TIME OF	RATIO
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	UPS	UPS	UPS	(l/s)	(m/s)	LOW (min)	Q/Q full
	107	108	0.13	0.68	0.25	1.74			0.00	0.00			0.00	0.00			0.00	0.00	12.00	69.90	94.70	110.97	162.15	122	525	525	CONC	2.25	13.0	105.578	106.103	108.963	645.0934	2.9800	0.0727	0.188
	108	110	0.18	0.68	0.34	2.14			0.00	0.00			0.00	0.00			0.00	0.00	12.07	69.67	94.40	110.60	161.61	149	525	525	CONC	2.25	50.5	105.255	105.780	108.569	645.0934	2.9800	0.2824	0.231
Contribution From STREET 2, Pipe 109 - 110						0.42				0.00				0.00				0.00	11.04																	
	110	111	0.47	0.68	0.89	3.44			0.00	0.00			0.00	0.00			0.00	0.00	12.35	68.81	93.21	109.21	159.57	237	675	675	CONC	0.15	83.0	103.969	104.644	107.070	325.5584	0.9098	1.5205	0.727
	111	112	0.49	0.68	0.93	4.37			0.00	0.00			0.00	0.00			0.00	0.00	13.87	64.56	87.38	102.35	149.50	282	675	675	CONC	0.20	88.0	103.824	104.499	106.903	375.9224	1.0505	1.3961	0.750
To STREET 3, Pipe 112 - 115						4.37				0.00				0.00				0.00	15.27																	
STREET 3																																				
Contribution From STREET 1, Pipe 101 - 102						2.29				0.00				0.00				0.00	14.13																	
			0.04	0.68	0.08	2.36			0.00	0.00			0.00	0.00			0.00	0.00																		
	102	105	0.20	0.68	0.38	2.74			0.00	0.00			0.00	0.00			0.00	0.00	14.13	63.89	86.46	101.27	147.91	175	525	525	CONC	2.25	60.0	105.311	105.836	108.777	645.0934	2.9800	0.3356	0.271
Contribution From STREET 2, Pipe 104 - 105						1.95				0.00				0.00				0.00	13.09																	
	105	112	0.25	0.68	0.47	5.16			0.00	0.00			0.00	0.00			0.00	0.00	14.47	63.05	85.31	99.91	145.92	325	675	675	CONC	0.25	65.0	103.811	104.486	106.847	420.2941	1.1745	0.9224	0.774
Contribution From STREET 1, Pipe 111 - 112						4.37				0.00				0.00				0.00	15.27																	
	112	115	0.19	0.68	0.36	9.89			0.00	0.00			0.00	0.00			0.00	0.00	15.39	60.86	82.31	96.38	140.74	602	825	825	CONC	0.30	55.0	103.498	104.323	106.717	786.2205	1.4708	0.6233	0.765
Contribution From STREET 6, Pipe 114 - 115						2.44				0.00				0.00				0.00	14.17																	
	115	118	0.20	0.68	0.38	12.70			0.00	0.00			0.00	0.00			0.00	0.00	16.02	59.47	80.41	94.15	137.47	755	900	900	CONC	0.30	60.0	103.258	104.158	106.607	991.5483	1.5586	0.6416	0.762
Contribution From STREET 7, Pipe 117 - 118						1.78				0.00				0.00				0.00	12.90																	
	118	125	0.25	0.68	0.47	14.95			0.00	0.00			0.00	0.00			0.00	0.00	16.66	58.11	78.56	91.97	134.27	869	975	975	CONC	0.25	65.0	103.003	103.978	106.447	1120.5266	1.5008	0.7218	0.776
Contribution From STREET 6, Pipe 124 - 125						4.33				0.00				0.00				0.00	14.91																	
	125	128	0.21	0.68	0.40	19.68			0.00	0.00			0.00	0.00			0.00	0.00	17.38	56.67	76.58	89.65	130.86	1115	1050	1050	CONC	0.30	55.0	102.765	103.815	106.317	1495.6798	1.7273	0.5307	0.746
Contribution From STREET 10, Pipe 127 - 128						2.61				0.00				0.00				0.00	14.24																	
	128	131	0.22	0.68	0.42	22.70			0.00	0.00			0.00	0.00			0.00	0.00	17.91	55.66	75.20	88.02	128.48	1264	1200	1200	CONC	0.20	66.5	102.450	103.650	106.207	1743.5652	1.5417	0.7189	0.725
To STREET 12, Pipe 131 - 141						22.70				0.00				0.00				0.00	18.63																	
STORM OUTLET 1																																				
Contribution From STREET 12, Pipe 131 - 141						24.65				0.13				0.00				0.00	19.06																	
Contribution From STREET 12, Pipe 140 - 141						11.29				1.46				0.00				0.00	16.39																	
	141	142			0.00	35.94			0.00	1.59			0.00	0.00			0.00	0.00	19.06	53.59	72.38	84.71	123.62	2041	1500	1500	CONC	0.15	51.5	101.961	103.461	106.000	2737.7609	1.5493	0.5540	0.745
	142	HW1			0.00	35.94			0.00	1.59			0.00	0.00			0.00	0.00	19.62	52.66	71.11	83.21	121.42	2005	1500	1500	CONC	0.15	16.0	101.824	103.324	104.340	2737.7609	1.5493	0.1721	0.733
STREET 8																																				
	214	215	0.44	0.68	0.83	0.83			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	64	375	375	PVC	0.30	63.5	103.984	104.359	106.860	96.0323	0.8695	1.2172	0.665
	215	217	0.29	0.68	0.55	1.38			0.00	0.00			0.00	0.00			0.00	0.00	11.22	72.43	98.18	115.05	168.15	100	450	450	CONC	0.25	66.0	103.718	104.168	106.733	142.5531	0.8963	1.2272	0.701
To STREET 9, Pipe 217 - 218						1.38				0.00				0.00				0.00	12.44																	
	222	223	0.36	0.68	0.68	0.68			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	52	375	375	PVC	0.30	51.5	103.984	104.359	106.860	96.0323	0.8695	0.9872	0.544
	223	224	0.16	0.68	0.30	0.98			0.00	0.00			0.00	0.00			0.00	0.00	10.99	73.21	99.25	116.32	170.01	72	375	375	PVC	0.30	13.0	103.799	104.174	106.760	96.0323	0.8695	0.2492	0.749
	224	225	0.21	0.68	0.40	1.38			0.00	0.00			0.00	0.00			0.00	0.00	11.24	72.36	98.09	114.95	168.00	100	450	450	CONC	0.25	46.5	103.685	104.135	106.739	142.5531	0.8963	0.8646	0.701
	225	226	0.16	0.68	0.30	1.68			0.00	0.00			0.00	0.00			0.00	0.00	12.10	69.58	94.27	110.45	161.39	117	450	450	CONC	0.30	13.0	103.539	103.989	106.652	156.1591	0.9819	0.2207	0.750
	226	227	0.37	0.68	0.70	2.38			0.00	0.00			0.00	0.00			0.00	0.00	12.32	68.91	93.34	109.37	159.80	164	525	525	CONC	0.25	63.0	103.425	103.950	106.630	215.0311	0.9933	1.0571	0.763
	227	228	0.40	0.68	0.76	3.14			0.00	0.00			0.00	0.00			0.00	0.00	13.38	65.88	89.19	104.48	152.62	207	600	600	CONC	0.20	67.5	103.192	103.792	106.507	274.5943	0.9712	1.1584	0.753
	228	229	0.15	0.68	0.28	3.42			0.00	0.00			0.00	0.00			0.00	0.00	14.54	62.88	85.08	99.65	145.53	215	600	600	CONC	0.25	9.0	103.027	103.627	106.370	307.0058	1.0858	0.1381	0.701
	229	230	0.34	0.68	0.64	4.06			0.00	0.00			0.00	0.00			0.00	0.00	14.68	62.54	84.62	99.10	144.73	254	675	675	CONC	0.20	86.5	102.929	103.604	106.349	375.9224	1.0505	1.3723	0.676
	230	233	0.31	0.68	0.59	4.65			0.00	0.00			0.00	0.00			0.00	0.00	16.05	59.40	80.32	94.04	137.31	276	675	675	CONC	0.20	90.0	102.736	103.411	106.176	375.9224	1.0505	1.4279	

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Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	UPS	UPS	UPS	(l/s)	(m/s)	LOW (min)	Q/Q full	
	207	208	0.61	0.68	1.15	5.37							0.00	0.00				0.00	0.00	17.06	57.30	77.44	90.66	132.34	308	750	750	CONC	0.15	103.5	103.787	104.537	107.122	431.1703	0.9760	1.7675	0.713
	208	213	0.53	0.68	1.00	6.37							0.00	0.00				0.00	0.00	18.83	54.00	72.93	85.36	124.57	344	750	750	CONC	0.20	98.0	103.612	104.362	106.917	497.8726	1.1270	1.4493	0.691
To STREET 5, Pipe 213 - 217						6.37								0.00					0.00	20.28																	
STREET 5																																					
	209	210	0.55	0.68	1.04	1.04							0.00	0.00				0.00	0.00	10.00	76.81	104.19	122.14	178.56	80	450	450	CONC	0.20	85.5	104.270	104.720	107.221	127.5033	0.8017	1.7775	0.626
	210	211	0.60	0.68	1.13	2.17							0.00	0.00				0.00	0.00	11.78	70.59	95.66	112.09	163.79	153	525	525	CONC	0.25	101.0	104.024	104.549	107.050	215.0311	0.9933	1.6946	0.714
	211	212	0.14	0.68	0.26	2.44							0.00	0.00				0.00	0.00	13.47	65.63	88.84	104.07	152.02	160	525	525	CONC	0.25	13.0	103.741	104.266	106.851	215.0311	0.9933	0.2181	0.744
	212	213	0.21	0.68	0.40	2.84							0.00	0.00				0.00	0.00	13.69	65.04	88.04	103.13	150.64	184	600	600	CONC	0.15	55.5	103.633	104.233	106.829	237.8056	0.8411	1.0998	0.776
Contribution From STREET 4, Pipe 208 - 213						6.37								0.00					0.00	20.28																	
	213	217	0.19	0.68	0.36	9.57							0.00	0.00				0.00	0.00	20.28	51.59	69.65	81.50	118.91	493	825	825	CONC	0.20	55.0	103.325	104.150	106.721	641.9463	1.2009	0.7633	0.769
To STREET 9, Pipe 217 - 218						9.57								0.00					0.00	21.04																	
STREET 9																																					
Contribution From STREET 5, Pipe 213 - 217						9.57								0.00					0.00	21.04																	
Contribution From STREET 8, Pipe 215 - 217						1.38								0.00					0.00	12.44																	
			0.09	0.68	0.17	11.12							0.00	0.00				0.00	0.00																		
	217	218	0.45	0.68	0.85	11.97							0.00	0.00				0.00	0.00	21.04	50.41	68.05	79.62	116.15	603	900	900	CONC	0.20	84.5	103.103	104.003	106.606	809.5958	1.2726	1.1067	0.745
	218	219	0.48	0.68	0.91	12.87							0.00	0.00				0.00	0.00	22.15	48.81	65.86	77.06	112.40	628	900	900	CONC	0.20	80.5	102.914	103.814	106.442	809.5958	1.2726	1.0543	0.776
	219	221	0.43	0.68	0.81	13.69							0.00	0.00				0.00	0.00	23.20	47.39	63.93	74.78	109.06	649	975	975	CONC	0.15	82.5	102.678	103.653	106.280	867.9562	1.1625	1.1828	0.747
To STREET 12, Pipe 221 - 233						13.69								0.00					0.00	24.39																	
STREET 12																																					
					0.00	0.00	0.10	0.68	0.19	0.19			0.00	0.00				0.00	0.00																		
	231	232			0.00	0.00	0.11	0.68	0.21	0.40			0.00	0.00				0.00	0.00	10.00	76.81	104.19	122.14	178.56	41	300	300	PVC	0.35	26.0	103.464	103.764	106.265	57.2089	0.8093	0.5354	0.723
					0.00	0.00	0.44	0.68	0.83	1.23			0.00	0.00				0.00	0.00																		
	232	233			0.00	0.00	2.45	0.40	2.72	3.95			0.00	0.00				0.00	0.00	10.54	74.81	101.45	118.91	173.81	401	825	825	CONC	0.15	103.5	102.830	103.655	106.213	555.9418	1.0400	1.6587	0.721
To STORM OUTLET 2, Pipe 233 - HW2						0.00				3.95				0.00					0.00	12.19																	
					0.00	0.00	0.33	0.68	0.62	0.62			0.00	0.00				0.00	0.00	10.00	76.81	104.19	122.14	178.56	65	450	450	CONC	0.20	45.5	102.833	103.283	104.060	127.5033	0.8017	0.9459	0.510
					0.00	0.00	0.36	0.68	0.68	1.30			0.00	0.00				0.00	0.00																		
	139	140	3.24	0.80	7.21	7.21			0.00	1.30			0.00	0.00				0.00	0.00	10.95	73.35	99.45	116.55	170.35	658	900	900	CONC	0.25	80.5	102.517	103.417	106.203	905.1556	1.4228	0.9430	0.727
Contribution From STREET 10, Pipe 137 - 140						4.08				0.00				0.00					0.00	16.15																	
	140	141			0.00	11.29	0.08	0.68	0.15	1.46			0.00	0.00				0.00	0.00	16.15	59.17	80.00	93.67	136.76	784	975	975	CONC	0.25	21.5	102.278	103.253	106.043	1120.5266	1.5008	0.2388	0.700
To STORM OUTLET 1, Pipe 141 - 142						11.29				1.46				0.00					0.00	16.39																	
Contribution From STREET 3, Pipe 128 - 131						22.70				0.00				0.00					0.00	18.63																	
Contribution From STREET 11, Pipe 130 - 131						1.95				0.00				0.00					0.00	13.14																	
	131	141			0.00	24.65	0.07	0.68	0.13	0.13			0.00	0.00				0.00	0.00	18.63	54.35	73.41	85.92	125.40	1349	1350	1350	CONC	0.15	37.5	102.167	103.517	106.076	2067.1669	1.4442	0.4328	0.653
To STORM OUTLET 1, Pipe 141 - 142						24.65				0.13				0.00					0.00	19.06																	
	220	221			0.00	0.00	0.21	0.68	0.40	0.40			0.00	0.00				0.00	0.00	10.00	76.81	104.19	122.14	178.56	41	300	300	PVC	0.35	26.5	103.378	103.678	106.178	57.2089	0.8093	0.5457	0.723
Contribution From STREET 9, Pipe 219 - 221						13.69				0.00				0.00					0.00	24.39																	
	221	233			0.00	13.69	0.26	0.68	0.49	0.89			0.00	0.00				0.00	0.00	24.39	45.90	61.90	72.40	105.57	683	1050	1050	CONC	0.15	65.0	102.479	103.529	106.125	1057.6053	1.2214	0.8870	0.646
To STORM OUTLET 2, Pipe 233 - HW2						13.69				0.89				0.00					0.00	25.27																	
STORM OUTLET 2																																					

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)																																					
Local Roads Return Frequency = 2 years Collector Roads Return Frequency = 5 years Arterial Roads Return Frequency = 10 years																																					
Manning		0.013		AREA (Ha)																FLOW					SEWER DATA												
LOCATION			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	INV	OBV	T/G	CAPACITY	VELOCITY	TIME OF	RATIO
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	UPS	UPS	UPS	(l/s)	(m/s)	LOW (min)	Q/Q full	
	315	316	0.14	0.68	0.26	3.52			0.00	0.00			0.00	0.00			0.00	0.00	13.36	65.94	89.27	104.57	152.76	232	525	525	CONC	0.50	13.0	102.668	103.193	105.729	304.0999	1.4048	0.1542	0.762	
	316	317			0.00	3.52			0.00	0.00			0.00	0.00			0.00	0.00	13.51	65.52	88.70	103.90	151.77	230	525	525	CONC	0.50	7.0	102.573	103.098	105.707	304.0999	1.4048	0.0830	0.758	
To STORM OUTLET 3, Pipe 317 - 318						3.52				0.00				0.00				0.00	13.59																		
	300	301	0.17	0.68	0.32	0.32			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	25	300	300	PVC	0.35	35.0	103.695	103.995	106.503	57.2089	0.8093	0.7208	0.431	
	301	302	0.15	0.68	0.28	0.60			0.00	0.00			0.00	0.00			0.00	0.00	10.72	74.14	100.53	117.83	172.23	45	300	300	PVC	0.40	9.0	103.542	103.842	106.416	61.1589	0.8652	0.1734	0.733	
	302	303	0.26	0.68	0.49	1.10			0.00	0.00			0.00	0.00			0.00	0.00	10.89	73.53	99.70	116.85	170.78	81	375	375	PVC	0.35	43.5	103.431	103.806	106.395	103.7267	0.9392	0.7720	0.777	
	303	304	0.34	0.68	0.64	1.74			0.00	0.00			0.00	0.00			0.00	0.00	11.67	70.95	96.15	112.66	164.64	123	525	525	CONC	0.20	66.0	103.129	103.654	106.306	192.3297	0.8885	1.2381	0.642	
	304	305	0.02	0.68	0.04	1.78			0.00	0.00			0.00	0.00			0.00	0.00	12.90	67.20	91.00	106.61	155.75	119	525	525	CONC	0.20	13.0	102.967	103.492	106.178	192.3297	0.8885	0.2439	0.621	
	305	306	0.14	0.68	0.26	2.04			0.00	0.00			0.00	0.00			0.00	0.00	13.15	66.51	90.06	105.50	154.12	136	525	525	CONC	0.20	46.5	102.911	103.436	106.157	192.3297	0.8885	0.8723	0.706	
	306	307	0.12	0.68	0.23	2.27			0.00	0.00			0.00	0.00			0.00	0.00	14.02	64.18	86.86	101.74	148.60	146	525	525	CONC	0.20	13.0	102.788	103.313	106.068	192.3297	0.8885	0.2439	0.757	
	307	308	0.51	0.68	0.96	3.23			0.00	0.00			0.00	0.00			0.00	0.00	14.26	63.56	86.01	100.74	147.13	205	600	600	CONC	0.20	80.5	102.687	103.287	106.047	274.5943	0.9712	1.3815	0.748	
	308	317	0.51	0.68	0.96	4.20			0.00	0.00			0.00	0.00			0.00	0.00	15.65	60.28	81.53	95.46	139.39	253	675	675	CONC	0.15	84.0	102.451	103.126	105.889	325.5584	0.9098	1.5389	0.777	
To STORM OUTLET 3, Pipe 317 - 318						4.20				0.00				0.00				0.00	17.18																		
STORM OUTLET 3																																					
Contribution From STREET 24, Pipe 308 - 317						4.20				0.00			0.00			0.00	17.18																				
Contribution From STREET 24, Pipe 316 - 317						3.52				0.00			0.00			0.00	13.59																				
	317	318	0.03	0.68	0.06	7.77			0.00	0.00			0.00	0.00			0.00	0.00	17.18	57.05	77.10	90.27	131.76	443	825	825	CONC	0.20	45.0	102.175	103.000	105.755	641.9463	1.2009	0.6245	0.690	
	318	HW3			0.00	7.77			0.00	0.00			0.00	0.00			0.00	0.00	17.81	55.85	75.46	88.33	128.92	434	825	825	CONC	0.15	17.5	101.526	102.351	103.890	555.9418	1.0400	0.2804	0.780	
STREET 14																																					
	426	427	0.12	0.68	0.23	0.23			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	17	300	300	PVC	0.35	26.0	102.958	103.258	105.758	57.2089	0.8093	0.5354	0.305	
	427	428	0.16	0.68	0.30	0.53			0.00	0.00			0.00	0.00			0.00	0.00	10.54	74.81	101.45	118.91	173.81	40	300	300	PVC	0.35	26.0	102.837	103.137	105.705	57.2089	0.8093	0.5354	0.692	
	428	429	0.53	0.68	1.00	1.53			0.00	0.00			0.00	0.00			0.00	0.00	11.07	72.92	98.86	115.86	169.33	112	525	525	CONC	0.20	87.0	102.521	103.046	105.650	192.3297	0.8885	1.6320	0.581	
	429	430	0.49	0.68	0.93	2.46			0.00	0.00			0.00	0.00			0.00	0.00	12.70	67.78	91.80	107.55	157.12	167	600	600	CONC	0.15	89.0	102.272	102.872	105.475	237.8056	0.8411	1.7636	0.700	
To STREET 18, Pipe 430 - 432						2.46				0.00				0.00				0.00	14.47																		
STREET 15																																					
			0.23	0.68	0.43	0.43			0.00	0.00			0.00	0.00			0.00	0.00																			
	420	421	1.62	0.68	3.06	3.50			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	269	600	600	CONC	0.35	33.0	102.640	103.240	105.741	363.2541	1.2847	0.4281	0.739	
	421	422	0.26	0.68	0.49	3.99			0.00	0.00			0.00	0.00			0.00	0.00	10.43	75.20	101.98	119.54	174.74	300	675	675	CONC	0.25	62.0	102.449	103.124	105.674	420.2941	1.1745	0.8798	0.714	
To STREET 13, Pipe 422 - 425						3.99				0.00				0.00				0.00	11.31																		
STREET 13																																					
					0.00	0.00	0.07	0.68	0.13	0.13			0.00	0.00			0.00	0.00																			
					0.00	0.00	0.17	0.68	0.32	0.45			0.00	0.00			0.00	0.00																			
	417	418			0.00	0.00	0.25	0.68	0.47	0.93			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	97	450	450	CONC	0.20	39.0	102.942	103.392	105.892	127.5033	0.8017	0.8108	0.757	
	418	419			0.00	0.00	0.56	0.68	1.06	1.98			0.00	0.00			0.00	0.00	10.81	73.83	100.10	117.32	171.47	199	600	600	CONC	0.20	94.5	102.714	103.314	105.815	274.5943	0.9712	1.6217	0.724	
	419	422			0.00	0.00	0.40	0.68	0.76	2.74			0.00	0.00			0.00	0.00	12.43	68.58	92.89	108.83	159.01	255	675	675	CONC	0.20	63.5	102.450	103.125	105.676	375.9224	1.0505	1.0074	0.677	
Contribution From STREET 15, Pipe 421 - 422					3.99				0.00				0.00	11.31				0.00	11.31																		

		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
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Definitions: Q = 2.78 AI _R , 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: A.S.	PROJECT: STITTSTVILLE SOUTH URBAN EXPANSION AREA		
		Checked: W.L.	LOCATION: City of Ottawa		
		Dwg. Reference: Storm Servicing Plan, Servicing Profiles	File Ref: 21-1247	Date: 14 Mar 2025	Sheet No. SHEET 5 OF 7

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

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:	Designed: A.S.	PROJECT: STITTSVILLE SOUTH URBAN EXPANSION AREA		
	1) Ottawa Rainfall-Intensity Curve 2) Min. Velocity = 0.80 m/s	Checked: W.L.	LOCATION: City of Ottawa		
		Dwg. Reference: Storm Servicing Plan, Servicing Profiles	File Ref: 21-1247	Date: 14 Mar 2025	Sheet No. SHEET 6 OF 7

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

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: A.S.	PROJECT: STITTSVILLE SOUTH URBAN EXPANSION AREA		
		Checked: W.L.	LOCATION: City of Ottawa		
		Dwg. Reference: Storm Servicing Plan, Servicing Profiles	File Ref: 21-1247	Date: 14 Mar 2025	Sheet No. SHEET 7 OF 7