

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	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)	(l/s)	(m/s)	LOW (min)	Q/Q full
STREET 5																																	
	116	117	0.22	0.77	0.47	0.47			0.00	0.00			0.00	0.00			0.00	0.00															
			0.22	0.80	0.49	0.96			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	74	375	375	PVC	0.55	75.0	130.0283	1.1773	1.0618	0.567
			0.17	0.80	0.38	1.34			0.00	0.00			0.00	0.00			0.00	0.00															
	117	118	0.21	0.77	0.45	1.79			0.00	0.00			0.00	0.00			0.00	0.00	11.06	72.96	98.90	115.91	169.40	130	525	525	CONC	0.30	69.0	235.5548	1.0881	1.0569	0.554
To STREET 3, Pipe 118 - 119						1.79				0.00				0.00				0.00	12.12														
STREET 4																																	
	113	114	0.48	0.80	1.07	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	75.0	135.8101	1.2296	1.0166	0.604
	114	115	0.38	0.80	0.85	1.91			0.00	0.00			0.00	0.00			0.00	0.00	11.02	73.11	99.11	116.16	169.77	140	525	525	CONC	0.25	69.0	215.0311	0.9933	1.1577	0.650
To STREET 3, Pipe 115 - 118						1.91				0.00				0.00				0.00	12.17														
STREET 1																																	
	102	103	0.20	0.77	0.43	0.43			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	33	300	300	PVC	1.10	43.0	101.4206	1.4348	0.4995	0.324
To STREET 3, Pipe 103 - 104						0.43				0.00				0.00				0.00	10.50														
	109	110	0.60	0.77	1.28	1.28			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	99	375	375	PVC	0.80	91.5	156.8200	1.4199	1.0740	0.629
	110	111	0.48	0.77	1.03	2.31			0.00	0.00			0.00	0.00			0.00	0.00	11.07	72.91	98.84	115.84	169.30	169	600	600	CONC	0.25	89.5	307.0058	1.0858	1.3738	0.549
To STREET 3, Pipe 111 - 112						2.31				0.00				0.00				0.00	12.45														
STREET 3																																	
	107	108	0.14	0.80	0.31	0.31			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	24	300	300	PVC	1.05	31.0	99.0888	1.4018	0.3686	0.241
Contribution From STREET 2, Pipe 106 - 108						1.48				0.50				0.00				0.00	12.35														
	108	111	0.22	0.80	0.49	2.28			0.00	0.50			0.00	0.00			0.00	0.00	12.35	68.82	93.22	109.22	159.59	204	600	600	CONC	0.35	60.0	363.2541	1.2847	0.7784	0.561
Contribution From STREET 1, Pipe 110 - 111						2.31				0.00				0.00				0.00	12.45														
	111	112	0.19	0.80	0.42	5.02			0.00	0.50			0.00	0.00			0.00	0.00	13.13	66.57	90.13	105.59	154.25	379	750	750	CONC	0.35	54.0	658.6236	1.4908	0.6037	0.575
	100	101	0.24	0.80	0.53	0.53			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	41	300	300	PVC	0.90	50.5	91.7384	1.2978	0.6485	0.447
	101	103	0.24	0.80	0.53	1.07			0.00	0.00			0.00	0.00			0.00	0.00	10.65	74.40	100.89	118.25	172.84	79	450	450	CONC	0.35	61.0	168.6711	1.0605	0.9586	0.471
Contribution From STREET 1, Pipe 102 - 103						0.43				0.00				0.00				0.00	10.50														
			0.27	0.77	0.58	2.07			0.00	0.00			0.00	0.00			0.00	0.00															
	103	104	0.29	0.80	0.64	2.72			0.00	0.00			0.00	0.00			0.00	0.00	11.61	71.14	96.41	112.97	165.09	193	600	600	CONC	0.35	93.5	363.2541	1.2847	1.2129	0.532
			0.26	0.77	0.56	3.28			0.00	0.00			0.00	0.00			0.00	0.00															
	104	112	0.29	0.80	0.64	3.92			0.00	0.00			0.00	0.00			0.00	0.00	12.82	67.44	91.33	107.00	156.32	264	675	675	CONC	0.35	95.5	497.2987	1.3897	1.1453	0.532
	112	115	0.21	0.80	0.47	9.40			0.00	0.50			0.00	0.00			0.00	0.00	13.97	64.32	87.06	101.97	148.93	648	900	900	CONC	0.35	54.0	1070.9945	1.6835	0.5346	0.605
Contribution From STREET 4, Pipe 114 - 115						1.91				0.00				0.00				0.00	12.17														
	115	118	0.24	0.80	0.53	11.85			0.00	0.50			0.00	0.00			0.00	0.00	14.50	62.97	85.21	99.79	145.74	789	900	900	CONC	0.45	60.0	1214.3936	1.9089	0.5239	0.650
Contribution From STREET 5, Pipe 117 - 118						1.79				0.00				0.00				0.00	12.12														
	118	119	0.20	0.80	0.44	14.08			0.00	0.50			0.00	0.00			0.00	0.00	15.02	61.71	83.48	97.76	142.76	911	975	975	CONC	0.40	50.5	1417.3665	1.8984	0.4434	0.643
	119	130	0.16	0.80	0.36	14.44			0.00	0.50			0.00	0.00			0.00	0.00	15.47	60.69	82.08	96.11	140.34	917	975	975	CONC	0.40	12.0	1417.3665	1.8984	0.1054	0.647
To POND INLET, Pipe 130 - 131						14.44				0.50				0.00				0.00	15.57														
	120	121	0.18	0.77	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	0.70	50.0	80.9057	1.1446	0.7281	0.366
	121	122	0.17	0.77	0.36	0.75			0.00	0.00			0.00	0.00			0.00	0.00	10.73	74.12	100.50	117.79	172.17	56	375	375	PVC	0.40	60.0	110.8885	1.0040	0.9960	0.501
	122	123	0.46	0.77	0.98	1.73			0.00	0.00			0.00	0.00			0.00	0.00	11.72	70.76	95.89	112.36	164.20	123	525	525	CONC	0.20	97.0	192.3297	0.8885	1.8196	0.638
	123	124	0.11	0.77	0.24	1.97			0.00	0.00			0.00	0.00			0.00	0.00	13.54	65.43	88.58	103.76	151.56	129	525	525	CONC	0.20	27.5	192.3297	0.8885	0.5159	0.670
	124	125	0.09	0.77	0.19	2.16			0.00	0.00			0.00	0.00			0.00	0.00	14.06	64.08	86.72	101.58	148.36	139	525	525	CONC	0.20	26.0	192.3297	0.8885	0.4877	0.720
	125	126	0.07	0.77	0.15	2.31			0.00	0.00			0.00	0.00			0.00	0.00	14.55	62.86	85.05	99.61	145.47	145	525	525	CONC	0.25	9.5	215.0311	0.9933	0.1594	0.676
	126	127	0.21	0.77	0.45	2.76			0.00	0.00			0.00	0.00			0.00	0.00	14.71	62.47	84.52	98.98	144.55	172	600	600	CONC	0.20	43.0	274.5943	0.9712	0.7379	0.628
	127	128	0.13	0.77	0.28	3.04			0.00	0.00			0.00	0.00			0.00	0.00	15.44	60.74	82.15	96.19	140.46	185	600	600	CONC	0.20	13.5	274.5943	0.9712	0.2317	0.672
	128	130	0.40	0.77	0.86	3.90			0.00	0.00			0.00	0.00			0.00	0.00	15.68	60.22	81.43	95.35	139.23	235	600	600							

Local Roads Return Frequency = 2 years Collector Roads Return Frequency = 5 years Arterial Roads Return Frequency = 10 years																																		
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	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)	(l/s)	(m/s)	LOW (min)	Q/Q full	
POND INLET																																		
Contribution From STREET 3, Pipe 119 - 130						14.44				0.50				0.00				0.00	15.57															
Contribution From STREET 3, Pipe 128 - 130						3.90				0.00				0.00				0.00	16.86															
	130	131			0.00	18.33			0.00	0.50			0.00	0.00			0.00	0.00	16.86	57.70	77.99	91.31	133.29	1097	1050	1050	CONC	0.35	38.5	1615.5188	1.8657	0.3439	0.679	
To POND INLET, Pipe 131 - 132						18.33				0.50				0.00				0.00	17.20															
Contribution From POND INLET, Pipe 130 - 131						18.33				0.50				0.00				0.00	17.20															
	131	132			0.00	18.33			0.00	0.50			0.00	0.00			0.00	0.00	17.20	57.01	77.05	90.20	131.67	1084	1050	1050	CONC	0.35	17.5	1615.5188	1.8657	0.1563	0.671	
	132	HW1			0.00	18.33			0.00	0.50			0.00	0.00			0.00	0.00	17.36	56.70	76.63	89.71	130.95	1078	1050	1050	CONC	0.35	8.0	1615.5188	1.8657	0.0715	0.667	
STREET 2																																		
	211	212	0.05	0.80	0.11	0.11			0.00	0.00			0.00	0.00			0.00	0.00																
To STREET 6, Pipe 212 - 213						0.64				0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	50	300	300	PVC	1.20	47.0	105.9304	1.4986	0.5227	0.468	
						0.64				0.00				0.00			0.00	0.00	10.52															
			0.05	0.80	0.11	0.11			0.00	0.00			0.00	0.00			0.00	0.00																
	105	106	0.35	0.77	0.75	0.86			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	66	300	300	PVC	0.85	81.5	89.1537	1.2613	1.0770	0.741	
			0.29	0.77	0.62	1.48			0.00	0.00			0.00	0.00			0.00	0.00																
	106	108			0.00	1.48	0.45	0.40	0.50	0.50			0.00	0.00			0.00	0.00	11.08	72.90	98.83	115.82	169.28	157	600	600	CONC	0.25	83.0	307.0058	1.085			