



Storm Sewer Design Sheet
Bayport Village - Phase 2 & High-rise Condo
5 yr Storm

<<< Elements Requiring Input Information

Rational Method Calculation:

$$Q = 2.78 \cdot (C_p \cdot C \cdot I \cdot A)$$

where,

Q = peak flow rate (L/s)

C_p = runoff coefficient factor for storms > 10-yr

C = runoff coefficient

I = rainfall intensity (mm/hr)

A = area (ha)

(C_p = 1.0 for the 2, 5 & 10-yr storm events and C_p = 1.1, 1.2 & 1.25 for the 25, 50 & 100-yr storm events respectively)

Manning's Formula Calculation:

$$V = (k \cdot R^{2/3} \cdot S^{1/2}) / n$$

$$Q = V \cdot A$$

MOE Velocity Requirements: 0.8m/s - 6.0m/s

where,

V = mean velocity (m/s)

k = 1.0 for SI units

R = hydraulic radius (m)

S = friction slope (m/m)

n = Mannings Coefficient **0.013**

Rainfall Intensity Calculation:

$$I = A \cdot T^B$$

Rainfall IDF Data: <http://www.mto.gov.on.ca/IDF/Curves/terms.shtml>

where,

I = Rainfall Intensity (mm/hr)

T = Time of Concentration (hr)

A = Rainfall IDF Coefficient

B = Rainfall IDF Coefficient

5-year 100-year

A = 29.7 49.9

B = -0.728 -0.726

Runoff Coeff. Factors, CF = 1.00 1.25

Date: 30-Apr-25

Project No: 07-010

Prepared by: JB

Street	Upstream MH	Downstream MH	Drainage Areas (ha)				Runoff Calculation Data						Sewer Calculation Data							Sewer Profile Data					
			C =	C =	C =	C =	Individual 2.78CA	Accumulated 2.78CA	Time of Concentration (mins)	Storm Event	Rainfall Intensity (mm/hr)	Peak Runoff Flow (L/s)	Diameter (mm)	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Pipe Flow Time (mins)	Pipe Storage Volume (m ³)	Fall in Sewer (m)	Drop in MH (m)	Top of Grate Elevation (m)		Invert Elevation (m)	
			0.20	0.40	0.65	0.75															DS	US	DS	US	DS
A5	MH A45	MH A44			0.53		0.96	0.96	10.00	5-year	109.46	104.83	375	0.50	53.50	129.34	1.13	0.79	6.1	0.27	0.05	181.20	181.04	179.91	179.64
A5-1	MH A44	MH A43			0.27		0.49	1.45	10.79	5-year	103.59	149.75	450	0.50	60.00	210.32	1.28	0.78	9.9	0.30	0.05	181.04	180.90	179.59	179.29
A5-2	MH A43	CBMH A42			0.45		0.81	2.26	11.57	5-year	98.45	222.38	525	0.71	39.20	378.05	1.69	0.39	8.8	0.28	0.05	180.90	179.93	179.24	178.96
A5-3	CBMH A42	CBMH A41			0.39		0.70	2.96	11.95	5-year	96.13	284.88	525	0.60	29.70	347.53	1.56	0.32	6.6	0.18	0.05	179.93	179.62	178.91	178.73
	CBMH A41	MH A4			0.00		0.00	2.96	12.27	5-year	94.31	279.48	525	0.90	4.70	425.63	1.90	0.04	1.1	0.04	0.00	179.62	179.94	178.68	178.64
B1-3	MH B27	MH B26			0.43		0.78	0.78	10.00	5-year	109.46	85.05	450	1.00	95.00	297.43	1.81	0.87	15.6	0.95	0.05	181.57	180.49	179.93	178.98
B1-2	MH B26	MH B22			0.70		1.26	2.04	10.87	5-year	102.98	210.28	450	1.60	55.70	376.23	2.29	0.41	9.1	0.89	0.13	180.49	179.81	178.93	178.04
B3-2	MH B25	MH B22			0.30		0.54	0.54	10.00	5-year	109.46	59.34	450	1.50	69.50	364.28	2.22	0.52	11.4	1.04	0.13	180.23	179.81	179.08	178.04
EX4, EX1, EX5, EX8, EX6, EX9, EX10, B3-1	MH B24	MH B23	105.21	0.15	0.52		59.60	59.60	96.00	5-year	21.09	1257.26	975	0.49	35.30	1636.57	2.12	0.28	27.2	0.17	0.05	180.15	180.06	178.24	178.07
B1-1	MH B23	MH B22			0.13		0.23	59.84	96.28	5-year	21.05	1259.57	975	0.50	12.90	1653.18	2.15	0.10	9.9	0.06	0.05	180.06	179.81	178.02	177.96
B1-4	MH B22	MH B21			0.56		1.01	63.43	96.38	5-year	21.03	1334.26	1050	0.89	66.50	2687.55	3.01	0.37	59.4	0.59	0.05	179.81	179.06	177.91	177.32
B4	MH B21	B3			0.57		1.03	64.46	96.75	5-year	20.98	1352.16	1050	0.50	14.10	2014.40	2.25	0.10	12.6	0.07	0.20	179.06	178.93	177.27	177.20
	B2	B3			0.26		0.29	57.70	98.12	5-year	20.76	1197.92	975	0.51	45.00	1669.63	2.17	0.35	34.7	0.23	0.10			177.33	177.10
EX7, B16	CBMH B55	CBMH B54	1.19		0.38		1.35	1.35	10.00	5-year	109.46	147.58	375	1.30	11.10	208.55	1.83	0.10	1.3	0.14	0.05	181.87	181.64	180.00	179.86
B16	CBMH B54	CBMH B53			0.01		0.02	1.37	10.10	5-year	108.66	148.47	375	1.30	32.50	208.55	1.83	0.30	3.7	0.42	0.05	181.64	180.33	179.81	179.39
B15	CBMH B53	MH B52			0.12		0.22	1.58	10.40	5-year	106.40	168.45	375	1.30	16.30	208.55	1.83	0.15	1.9	0.21	0.05	180.33	180.85	179.34	179.13
	MH B52	CBMH B51A			0.00		0.00	1.58	10.55	5-year	105.31	166.72	450	0.50	15.70	210.32	1.28	0.20	2.6	0.08	0.05	180.85	180.42	179.08	179.00
B14	CBMH B51B	CBMH B51A			0.22		0.40	0.40	10.00	5-year	109.46	43.51	450	0.53	51.10	216.53	1.32	0.65	8.4	0.27	0.05	180.75	180.42	179.27	179.00
B13	CBMH B51A	MH B51			0.51		0.92	2.90	10.75	5-year	103.84	301.39	525	0.50	62.50	317.25	1.42	0.73	14.0	0.31	0.05	180.42	180.33	178.95	178.64
B7	MH B51	STM DHMH			0.62		1.12	4.02	11.48	5-year	98.97	398.13	600	0.50	38.60	452.94	1.55	0.41	11.3	0.19	0.06	180.33	180.01	178.59	178.40
	B8	B7			0.20		0.22	0.22	10.00	5-year	109.46	24.34	300	0.20	46.08	45.12	0.62	1.24	3.4	0.09	0.11	180.15	180.21	179.06	178.97
	B7	B6			0.00		0.00	0.22	11.24	5-year	100.52	22.35	525	0.52	48.00	323.53	1.45	0.55	10.7	0.25	0.02	180.21	180.30	178.86	178.61
	B6	STM DHMH			0.15		0.17	0.39	11.79	5-year	97.07	37.78	675	0.42	58.10	568.32	1.54	0.63	21.5	0.24	0.01	180.30	180.01	178.59	178.35
	STM DHMH	B5			0.00		0.00	4.41	12.42	5-year	93.46	412.33	675	0.44	38.30	581.69	1.57	0.41	14.1	0.17	0.07	180.01	179.72	178.34	178.17
	B5	B4			0.17		0.19	4.60	12.83	5-year	91.30	420.07	750	0.46	93.00	787.71	1.73	0.90	42.4	0.43	0.05	179.72	179.31	178.10	177.67
	B4	B31			0.41		0.46	5.06	13.73	5-year	86.92	439.52	750	0.39	46.70	725.30	1.59	0.49	21.3	0.18	0.01	179.31	179.05	177.62	177.44
	B31	B3			0.18		0.20	5.26	14.22	5-year	84.73	445.41	750	0.58	64.00	884.51	1.94	0.55	29.2	0.37	0.06	179.05	178.93	177.43	177.06
	B3	B1			0.00		0.00	127.42	98.47	5-year	20.71	2638.63	1050	0.30	26.00	1560.35	1.75	0.25	23.2	0.08	0.02	178.93	179.10	177.00	176.92
	B1	B11			0.00		0.00	127.42	98.71	5-year	20.67	2633.80	1050	3.68	14.50	5464.94	6.11	0.04	13.0	0.53	0.04	179.10	178.45	176.90	176.37
	B11	OF			0.25		0.28	127.70	98.75	5-year	20.66	2638.78	1050	0.88	26.60	2672.41	2.99	0.15	23.8	0.23		178.45	177.88	176.33	176.10
C9	CBMH C24	CBMH C23D			0.02		0.04	0.04	10.00	5-year	109.46	3.96	300	0.70	34.00	84.40	1.16	0.49	2.5	0.24	0.05	181.92	180.72	180.29	180.05
C8	CBMH C23D	CBMH C23C			0.16		0.29	0.33	10.49	5-year	105.71	34.38	300	0.50	15.30	71.33	0.98	0.26	1.1	0.08	0.05	180.72	181.00	180.00	179.92
C7	CBMH C23C	CBMH C23B			0.13		0.23	0.56	10.75	5-year	103.84	58.17	375	0.50	18.90	129.34	1.13	0.28	2.2	0.09	0.05	181.00	181.35	179.87	179.78
C13	CB 26A	CBMH C26			0.36		0.65	0.65	10.00	5-year	109.46	71.21	300	3.00	49.60	174.73	2.39	0.35	3.6	1.49	0.26	187.05	185.55	183.03	181.54
C12	CBMH C26	CBMH C25			0.15		0.27	0.92	10.35	5-year	106.79	98.41	300	8.50	15.60	294.12	4.03	0.06	1.1	1.33	0.05	185.55	181.81	181.28	179.95
C11	CBMH C25	CBMH C23B			0.03		0.05	0.98	10.41	5-year	106.31	103.73	375	1.00	12.30	182.91	1.60	0.13	1.4	0.12	0.05	181.81	181.35	179.90	179.78
C1	CBMH C23B	MH C23A			0.05		0.09	1.63	11.03	5-year	101.93	165.77	450	0.50	16.00	210.32	1.28	0.21	2.6	0.08	0.05	181.35	181.65	179.73	179.65
	MH C23A	MH C23			0.00		0.00	1.63	11.24	5-year	100.55	163.53	450	0.50	29.10	209.26	1.27	0.38	4.8	0.14	0.03	181.65			