

RATIONAL METHOD PIPE DESIGN WORKSHEET

LOCATION	PIPE SEGMENT		INCREMENTAL AREA		FLOW TIME (min.)				DESIGN CONDITIONS				Design (100-Yr)		Inverts		Remarks					
	From	To	DESIGNATION	A (Acres)	Total A	C	C*A	Sum (C*A)	To Inlet	In Chan.	Tot.	I (in/hr)	100-Yr Q (cfs)	100-Yr Pipe Diam (in.)	Length (ft)	Slope (%)		Q-fall (cfs)	V-Fall (fps)	V-Peak (fps)	Up	Down
SITE TO BASIN2																						
	CB-12	DMH11		0.490		0.42	0.21		10		10	6.0	1.23		15	12	0.040	14.03				
	CB-13	DMH11		0.100		0.90	0.09		5		5	6.0	0.54		12	12	0.040	7.74	1.01	336.9	336.40	CB12-DMH11
	DMH11	DMH12			0.590			0.30	7		7	6.0	1.77		12	61	0.020	5.47	0.69	336.90	336.40	CB13-DMH11
																		2.26	336.30	333.25	DMH11-DMH12	
	DMH12	DMH13		0.590		0.66	0.39		10		10	6.0	2.34		12	106	0.050	8.65	2.98	330.25	325	DMH12-DMH13
	CB14	DMH13		0.088		0.9	0.08		5		5	6.0	0.48		12	42	0.065	8.06	3.25	327.75	325	CB14-DMH13
	CB15	DMH13		0.280		0.42	0.20	0.20	10		15	6.0	1.20		12	14	0.070	10.23	1.53	327	326	CB15-DMH13
	DMH13	HW2		0.960		0.45	0.43		10		15	6.0	2.59		12	72	0.023	5.87	3.30	327.25	323.00	DMH13-HW2
POND-2		BASIN	Q Values For Pond Outlet Based on TR-20 25-Year Storm									Q ₂₅	0.46		15	20	0.038	13.58	1.01	322.75	322.00	15"HPDE -Settling Pond
POND-2		BASIN	Q Values For Pond Outlet Based on TR-20 100-Year Storm									Q ₁₀₀	4.56		15	20	0.038	13.58	3.72	322.75	322.00	15" HDPE -Settling Pond

Notes:
1) Runoff Coefficient C-Values used; Impervious(Pavement) C=0.90 Grass/OpenSpace C=0.20, Residential Suburban C=25-40, Mannings "n" HDPE n=0.012, RCP n=0.013
2) Rainfall Intensity I (in/hr) values taken from Figure 10-4 Intensity-Duration-Frequency Curve for Boston, Massachusetts, Mass Highway Design Manual.
3) Five (5) minute minimum flow time used for minimum time of concentration (Tc) to CB inlet to system
4) Massachusetts Cascade Grate Inlet Capacity = 1.26 cfs @ 100% efficiency, Standard Grate = 0.95 cfs cs PL
5) Blue Highlight denotes calculated peak flow (cfs) to CB Inlet

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LOCATION	PIPE SEGMENT		INCREMENTAL AREA		FLOW TIME (min.)			100-Yr f (in/hr)	100-Yr Q (cfs)	DESIGN CONDITIONS				Design (100-Yr)		Inverts		Remarks			
	From	To	DESIGNATION	A (Acres)	Total A	C	C*A			Sum (C*A)	To Inlet	In Chan.	Tot.	Pipe Diam (in.)	Length (ft)	Slope (%)	Q-full (cfs)		V-Full (fps)	V-Peak (fps)	Up
SITE TO ST1																					
	CB-1	ST-1				0.62	0.06		5	6.0	5	12	16	0.016	4.89		6.23	0.43	330	329.75	CB1-ST1
	CB-2	ST-1		0.090		0.90	0.04		5	6.0	5	8	12	0.020	1.86		5.32	0.62	330.00	329.75	CB2-ST1
	ST-1	HW1		0.040	0.130			0.09	7	6.0	7	12	20	0.020	5.47		6.97	0.70	329.65	329.45	ST1-HW1
SITE TO BASIN 3																					
	CB-5	DMH-5		0.480		0.62	0.30		10	6.0	10	12	16	0.016	4.89		6.23	2.27	340	339.75	CB5-DMH5
	CB-6	DMH-5		0.060		0.9	0.05		5	6.0	5	12	12	0.020	8.06		4.57	3.25	340	399.75	CB6-DMH5
	DI-1	DMH-5		0.320		0.42	0.20	0.20	10	6.0	15	12	37	0.020	5.47		6.97	1.53	340	399.75	DI1-DMH5
	DMH5	DMH4		0.860		0.65	0.56		10	6.0	15	12	72	0.023	5.87		7.47	4.27	339.65	338.00	DMH5-DMH4
	DMH4	DMH-3		0.860		0.65	0.56		10	6.0	15	12	50	0.038	7.54		9.61	4.27	337.90	336.00	DMH4-DMH3
	DMH-3	DMH-2		0.860		0.65	0.56	0.56	10	6.0	15	12	78	0.050	8.65		11.02	4.28	335.90	332.00	DMH3-DMH2
	DI2	CB3		0.34		0.62		0.21	10	6.0	15	12	31	0.020	5.47		6.97	1.53	334.50	333.00	DI2-CB3
	CB3	DMH-2		0.34		0.62		0.21	10	6	10	12	16	0.016	4.89		6.23	2.27	333.00	332.5	CB3-DMH2
	CB4	DMH-2		0.040		0.90	0.04		5	6.0	5	12	12	0.020	8.06		4.57	3.25	333.00	332.50	CB4-DMH2
	DMH2	FES3A		1.580		0.62	0.98		15	6.0	15	15	18	0.020	9.92		8.09	4.79	332.00	331.50	DMH2-FES3A
POND-3		BASIN	Q Values For Pond Outlet Based on TR-20 25-Year Storm									15	18	0.010	4.71		3.84	2.01	332.20	332.00	15"HDPE -Settling Pond
POND-3		BASIN	Q Values For Pond Outlet Based on TR-20 100-Year Storm									15	18	0.010	7.01		5.72	4.79	322.20	332.00	15" HDPE -Settling Pond

Notes:

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