

**New York State Department of Environmental Conservation (NYSDEC)
Water Quality Volume (WQv) & Water Quality Peak Flow (Qp) Calculation Worksheet**

Project:
Location: VILLAGE OF MAMARONECK, NEW YORK
Date:
Revised: -
Village of Mamaroneck Project:

TR-55 AND TR-20 RAINFALL DISTRIBUTION TYPE= ($R=I_a/P$) $C_i=A*R^2+B*R+C$	III = (USER INPUT VALUE)		
	A	B	C
Coefficients for unit peak discharge equation	C₀	-1.774	0.3301
Coefficients for unit peak discharge equation	C₁	1.8622	-0.7397
Coefficients for unit peak discharge equation	C₂	-0.0648	0.2276

INPUT CRITERIA:

	ABBREVIATION	UNITS	TRIBUTARY (TREATED) AREA PDA (Trench Drain)
TOTAL DEVELOPED (GREATER OF DISTURBED OR TRIBUTARY) AREA	A	acres	0.20 = (USER INPUT VALUE)
IMPERVIOUS SURFACE AREA	I	acres	0.14 = (USER INPUT VALUE)
NYSDEC 90% RAINFALL EVENT NUMBER (1)	P	inches	1.30 = (USER INPUT VALUE)
TIME OF CONCENTRATION	T_c	hours	0.02 = (USER INPUT VALUE)

CALCULATIONS:

WATER QUALITY VOLUME (2)(3)

STORMWATER MANAGEMENT PRACTICES			Infiltration = (USER INPUT VALUE)
REQUIRED WATER QUALITY VOLUME $WQ_v=3630*P(0.05*A+0.9*I)$	WQ_v	acres-ft	0.015
REQUIRED WATER QUALITY VOLUME (100% FOR NEW DEVELOPMENT)	WQ_v	cu. ft.	642
REQUIRED REDEVELOPMENT WATER QUALITY VOLUME (75%)	WQ_v	cu. ft.	481
REQUIRED PRETREATMENT WATER QUALITY VOLUME (25%)	WQ_v	cu. ft.	160
PROVIDED WQ_v VOLUME	WQ_v	cu. ft.	- = (USER INPUT VALUE)

WATER QUALITY PEAK FLOW (4)

RUNOFF VOLUME $Q=WQ_v/(A*3600)$	Q	inches	0.88
$CN=1000/(10+5*P+10*Q-10(Q^2+1.25*Q*P)^{1/2})$	CN		95.72
CN ROUNDED	CN		96
$CN < \text{or} = 98$	CN		96
INITIAL ABSTRACTION ($I_a=200/CN-2$)	I_a	inches	0.08
RATIO $R=I_a/P$	R		0.06
$C_0 = A*R^2 + B*R + C$	C₀		2.47
$C_1 = A*R^2 + B*R + C$	C₁		-0.50
$C_2 = A*R^2 + B*R + C$	C₂		-0.18
UNIT PEAK DISCHARGE $q_u=10*(C_0+C_1*\text{Log}(T_c)+C_2*(\text{Log}(T_c))^2)$	q_u	cfs/m ² /in	644.04
REQUIRED NEW DEVELOPMENT WATER QUALITY PEAK FLOW $Q_p=q_u*A*Q/640$ (100%)	Q_p	cfs	0.18
REQUIRED REDEVELOPMENT WATER QUALITY PEAK FLOW (75%)	Q_p	cfs	0.13
PROVIDED WATER QUALITY PEAK FLOW	Q_{p,P}	cfs	2.88 = (USER INPUT VALUE)
MARKETED PEAK TREATMENT FLOW		cfs	2.88 = (USER INPUT VALUE)
VERIFIED DESIGN (100% FLOW RATE) PER NYSDEC		cfs	N/A = (USER INPUT VALUE)
WATER QUALITY UNIT PRODUCT AND MODEL		each	StormTech SC-740 Chamber = (USER INPUT VALUE) 4 Chambers

References:

- (1) Refer to Section 4.2 Water Quality Volume (WQv) Figure 4.1 "90% Rainfall in New York State" in the [New York State Stormwater Design Manual](#), last revised August 2010.
- (2) Refer to Sections 4.1 and 4.2 for Water Quality Volume (WQv) calculations in the [New York State Stormwater Design Manual](#), last revised August 2010.
- (3) Refer to Section 9.3.2 "Sizing Criteria" for Water Quality Volume (WQv) calculations for Redevelopment Projects in the [New York State Stormwater Design Manual](#), last revised August 2010.
- (4) Refer to Appendix B.2 "Water Quality Peak Flow Calculation" in the [New York State Stormwater Design Manual](#), last revised August 2010.