Version 1.6 Total Water Quality Volume Calculation
Last Updated: 03/28/2014 WQv(acre-feet) = [(P)(Rv)(A)] /12

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....	No

Design Point:	1		*Manually enter P, Total Area and Impervious Cover.*
P=	0.90	*inch*	

Breakdown of Subcatchments

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
1	2.65	1.25	47%	0.47	4,108	Infiltration Basin
2	0.64	0.07	11%	0.15	310	Tree Planting/Tree Pit
3						
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	3.29	1.32	40%	0.41	**4,419**	**Subtotal 1**
Total	3.29	1.32	40%	0.41	**4,419**	**Initial WQv**

Identify Runoff Reduction Techniques By Area

Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Conservation of Natural Areas	0.00	0.00	*minimum 10,000 sf*
Riparian Buffers	0.00	0.00	*maximum contributing length 75 feet to 150 feet*
Filter Strips	0.00	0.00	
Tree Planting	0.64	0.07	*Up to 100 sf directly connected impervious area may be subtracted per*
Total	**0.64**	**0.07**	

Recalculate WQv after application of Area Reduction Techniques

	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*
"<<Initial WQv"	3.29	1.32	40%	0.41	4,419
Subtract Area	-0.64	-0.07			
WQv adjusted after Area Reductions	**2.65**	**1.25**	47%	0.47	4,108
Disconnection of Rooftops		0.16			
Adjusted WQv after Area Reduction and Rooftop Disconnect	2.65	1.09	41%	0.42	**3,647**
WQv reduced by Area Reduction techniques					772

Runoff Reduction Volume and Treated volumes						
	Runoff Reduction Techiques/Standard SMPs		**Total Contributing Area**	**Total Contributing Impervious Area**	**WQv Reduced (RRv)**	**WQv Treated**
			(acres)	**(acres)**	**cf**	**cf**
Area/Volume Reduction	Conservation of Natural Areas	RR-1	0.00	0.00		
	Sheetflow to Riparian Buffers/Filter Strips	RR-2	0.00	0.00		
	Tree Planting/Tree Pit	RR-3	0.64	0.07		
	Disconnection of Rooftop Runoff	RR-4		0.16		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	Stormwater Planter	RR-7	0.00	0.00	0	
	Rain Barrel/Cistern	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Intensive & Extensive)	RR-10	0.00	0.00	0	
Standard SMPs w/RRv Capacity	Infiltration Trench	I-1	0.00	0.00	0	0
	Infiltration Basin	I-2	2.65	1.09	3647	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4	0.00			
	Bioretention & Infiltration Bioretention	F-5	0.00	0.00	0	0
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention (P-1)	P-1				
	Wet Pond (P-2)	P-2				
	Wet Extended Detention (P-3)	P-3				
	Multiple Pond system (P-4)	P-4				
	Pocket Pond (p-5)	P-5				
	Surface Sand filter (F-1)	F-1				
	Underground Sand filter (F-2)	F-2				
	Perimeter Sand Filter (F-3)	F-3				
	Organic Filter (F-4	F-4				
	Shallow Wetland (W-1)	W-1				
	Extended Detention Wetland (W-2	W-2				
	Pond/Wetland System (W-3)	W-3				
	Pocket Wetland (W-4)	W-4				
	Wet Swale (O-2)	O-2				
Totals by Area Reduction		→	0.64	0.23	772	
Totals by Volume Reduction		→	0.00	0.00	0	
Totals by Standard SMP w/RRV		→	2.65	1.09	3647	0
Totals by Standard SMP		→	0.00	0.00		0
Totals (Area + Volume + all SMPs)		→	3.29	1.32	4,419	0

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A	2.08	55%
B		40%
C	1.21	30%
D		20%
Total Area	3.29	
Calculate the Minimum RRv		
S =	**0.46**	
Impervious =	1.32	*acre*
Precipitation	0.9	*in*
Rv	0.95	
Minimum RRv	**1,877**	***ft3***
	0.04	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	4419	*0.101*
30	Total RRV Provided	4419	*0.101*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	1877	*0.043*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	4419	*0.101*
34	Sum of Volume Reduced and Treated	4419	*0.101*
35	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

Apply Peak Flow Attenuation			
36	Channel Protection	*Cpv*	
37	Overbank	*Qp*	
37	Extreme Flood Control	*Qf*	
	Are Quantity Control requirements met?	*Yes*	Plan Completed

Disconnection of Roof Tops

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice			
Catchment Number	**Impervious Area To Be Disconnected** *(Acres)*		**Description**
1	0.16		Disconnection of Rooftops

Design Elements			
Is another area based practice applied to this area?	*No*		
Soil Type	A		
Has an evaluation by licensed or certified professional determined if soil enhancement & spreading device needed to provide sheet flowover grass surfaces?	*No*	*Y/N*	*required for C or D soils.*
Hotspot Area?	*No*		
Length of flow path from Impervious Surfaces	75	*ft*	*75 feet maximum*
Distance of downspouts from impervious areas	20	*ft*	*>10 feet*
Contributing Area of Rooftop to Downspout	500	*sf*	*Okay*
Contributing Area of Rooftop	500	*sf*	*500 sf maximum. Up to 2000 sf with suitable flow dispersion technique*
Method of flow dispersion	Spblk		*required If area to downspout >500 sf*
Flow length thru vegetated channel, swale or filter	75	*ft*	*vegetated area must be equal to or greater than the length of contributing impervious*
Slope of vegetated area receiving flow	1	*%*	*Average slope ≤5%*
Will overflow occur to undesignated Areas?	*No*		
Are All Criteria in Section 5.3.5 met?	*Yes*		

Area Reduction Adjustments			
Subtract		***Acres from total Area***	
Subtract	**0.16**	***Acres from the Total Impervious Area of Sub-catchment Number***	**1**

Disconnection of Roof Tops

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice			
Catchment Number	**Impervious Area To Be Disconnected** *(Acres)*		**Description**
2	0.06		Disconnection of Rooftops

Design Elements			
Is another area based practice applied to this area?	*No*		
Soil Type	A		
Has an evaluation by licensed or certified professional determined if soil enhancement & spreading device needed to provide sheet flowover grass surfaces?	*No*	*Y/N*	*required for C or D soils.*
Hotspot Area?	*No*		
Length of flow path from Impervious Surfaces	75	*ft*	*75 feet maximum*
Distance of downspouts from impervious areas	20	*ft*	*>10 feet*
Contributing Area of Rooftop to Downspout	500	*sf*	*Okay*
Contributing Area of Rooftop	500	*sf*	*500 sf maximum. Up to 2000 sf with suitable flow dispersion technique*
Method of flow dispersion	Spblk		*required If area to downspout >500 sf*
Flow length thru vegetated channel, swale or filter	75	*ft*	*vegetated area must be equal to or greater than the length of contributing impervious*
Slope of vegetated area receiving flow	1	*%*	*Average slope ≤5%*
Will overflow occur to undesignated Areas?	*No*		
Are All Criteria in Section 5.3.5 met?	*Yes*		

Area Reduction Adjustments			
Subtract	**0.06**	***Acres from the Total Impervious Area of Sub-catchment Number***	**2**

Infiltration Basin Worksheet

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	2.65	1.25	0.47	0.47	4108.25	0.90	Infiltration Basin
Enter Impervious Area Reduced by Disconnection of Rooftops		0.16	41%	0.42	3,647	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Pretreatment Techniques to Prevent Clogging			
Infiltration Rate	1.00	*in/hour*	*Okay*
Pretreatment Sizing	25	*% WQv*	*25% minimum;* *50% if >2 in/hr* *100% if >5in/hour*
Pretreatment Required Volume	912	*ft^3*	
Pretreatment Provided	1,430	*ft^3*	
Pretreatment Techniques utilized	*Sedimentation Basin*		

Size An Infiltration Basin			
Design Volume	3,647	*ft^3*	WQv
Basal Area Required	1,216	*ft^2*	*Infiltration practices shall be designed to exfiltrate the entire WQv through the floor of each practice.*
Basal Area Provided	4,194	*ft^2*	
Design Depth	3.00	*ft*	
Volume Provided	12,582	*ft^3*	*Storage Volume provided in infiltration basin area (not including pretreatment.*

Determine Runoff Reduction			
RRv	**3,647**	***ft^3***	***90% of the storage provided in the basin or WQv whichever is smaller***
Volume Treated	0	*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*
Sizing √	OK		*The infiltration basin must provide storage equal to or greater than the WQv of the contributing area.*

Tree Planting/Tree Pits

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
2	0.64	0.07	0.11	0.15	310.37	0.90	Tree Planting/Tree Pit

Do you intend to use this practice for area reduction or volume reduction?	Area	Design practice using criteria below	
Design Elements			
Is another area based practice applied to this area?	*No*		
Diameter of Mature Canopy	16	*ft*	
Area Reduced per Tree	100	*sf*	*For up to a 16-foot diameter canopy of a mature tree, the area considered for reduction shall be ½ the area of the tree*
Number of Trees	15		
Total Area Reduced	1507.2	*sf*	
	0.03	*af*	*Practice too small. Plant more trees.*
Area Ratio: Total to Impervious area	9.1		*Okay*
Are All Criteria in Section 5.3.4 met?	*Yes*		
Area Reduction Adjustments			
Subtract	**0.64**	***Acres from total Area***	
Subtract	**0.07**	***Acres from total Impervious Area***	