

APPENDIX C - FACILITY SIZING CALCULATIONS

Organization of Data in this Appendix	
Table	Description
UD-1	SSF sizing calculations
UD-2	CN Weighing and WQv 90%volume calculation
UD-2A	RRv Gross, Minimum and Total Achieved
UD-2B	Area PA Pavement, RRV Credit for PA, DEP 20% Impervious check
UD-2C	DSW Sizing Calculations
UD-2D	WQv 1-yr, DSW Underdrain, DSW available Storage
UD-2E	DSW Exfiltration, DSW Floor Drawdown, DSW/SSF RRV credit
UD-2F	Qp for Offline Flow Diversion Structures

Table UD-1. Surface Sand Filter Calculations Design Calculation Summary

Print: 4/1/2011
 Rev: 3/14/2011

Forebay/Pretreatment Area Sizing and Volume

Location: Proposed UD Parking Area

	1yr storm value	Units	Variable, Description...
Forebay		9370 cf	WQv treated in this pretreatment area
		<input type="checkbox"/> Y	Check <75% Imperv Check Y/N, Is imperviousness less or equal to 75%, if so full pretreatment (NYSSMDM 6.4.1)
		618 sf	Apt, Filter Surface area needed for pretreatment basin, equation from NYSSMDM 6.4.3 (considered at sideslope mid-height MD Appendix C.2)
		<input type="checkbox"/> 2.5	1:X, rise to run
		<input type="checkbox"/> 3	ft Df, Proposed Forebay water Depth
		<input type="checkbox"/> 14.5	Wf, Proposed Forebay Floor Width
		21.75	Lfb, Calculated Forebay Floor Length @ 1.5L to 1W ratio
		644 sf	Apt, Surface area provided in pretreatment basin, measured at MIDHEIGHT
		764.5 sf	Apt ACAD for odd shape, 765 per takeoff 02/23/11
		OK Check Apt	Check if surface Apt at midheight is greater than Apt Surface needed.
		2099 cf	V Forebay provided, at depth Df
		2294 cf	V Forebay provided ACAD, at depth Df, 2294 per area takeoff 02/23/11
		2343 cf	Min Pretreatment Volume, at 25% WQv, standard NYSSMDM 6.4.3
		close enough -> N/R cf	can regrade slightly to get 50cf=2cy Min Pretreatment Volume, at 40% WQv, for Cold Climate Criteria NYSSMDM 6.4.7
	Filter Bed		9370 cf
		<input type="checkbox"/> 4	ft D, Max Height of Water above filter bed, used for average height calc
		<input type="checkbox"/> 1.5	ft df, Filter Bed Depth
		<input type="checkbox"/> 3.5	ft/day k, Coefficient of Permeability for Filter Media (Sand=3.5 ft/day)
		<input type="checkbox"/> 2	ft hf, Average Height of Water above filter bed
		<input type="checkbox"/> 1.67	days tf, Design Filter bed drain time (1.67 for sand filters NYSSMDM, Iowa 24h for trout waters)
		687 sf	Asf, Filter Bed Surface Area needed, per NYSSMDM 6.4.4
		879 sf	Asf ACAD, = 879 sf of overall floor, 02/23/11
		<input type="checkbox"/> 2.5	1:X, rise to run
		<input type="checkbox"/> 60	ft Proposed Floor Length Lf
		<input type="checkbox"/> 6	ft Proposed Floor Width Wf
		360 sf	Asf, calculated
		OK Check Asf	Check if floor area provided in greater than Asf needed, as shown above
		4880 cf	Vf, Volume in open filter area provided, Calculated
		<input type="checkbox"/> 8260	cf Vf ACAD, Volume in open filter area provided, 8260 from takeoff 02/23/11
	7027.5 cf	Minimum Vol that must be held in combined pretreatment and filter areas, 75% WQv	
	OK Check 75%WQv	Check if entire system temporarily holds 75% of WQv prior to treatment NYSSMDM 6.4.4	
	<input type="checkbox"/> 18	in Depth of Sand Layer with 40% porosity	
	<input type="checkbox"/> 18	in Depth of Stone Underdrain Layer with 40 percent porosity	
	824.4 cf	Vsubgrade, based on Asf calculated, subgrade storage volume	
	1054.8 cf	Vsubgrade, based on Asf ACAD, subgrade storage volume	
	5704.4 cf	Vtotal based on x by y square footage	
	9314.8 cf	Vtotal based on ACAD polygons for Area	

Use SSF shown on UD parking layout as of 2/23/11

Table UD-2 Belleayre UMP/DEIS Stormwater Management System Calculations											Print:	4/1/2011
Location: Proposed UD Parking Area											Rev:	3/14/2011
Location: Proposed UD Parking Area												
Post-Development Conditions												
Composite Curve Number and WQv Calcs												
Variables												
WQv90 P=											1.3	in
1-yr 24 hr P=											3.5	in
Note: These area calculations do not consider Porous Pavement in lieu of conventional Asphalt.												
Subcatchments to Tiered DDPs												
Percent Cover												
Area Cover												
Grassed Area												
Imperv. Parking												
Wooded												
Grassed Area												
Imperv. Parking												
Wooded												
Weighted												
Pre Green Infrastructure "Base"												
WQv 90%												
Subcatchment	(sf)	(sq. mi.)	(Acres)	Grassed Area CN=74	Imperv. Parking Rd./Roof, I CN=98	Wooded CN=70	Grassed Area CN=74 (sf)	Imperv. Parking Rd./Roof, I CN=98 (sf)	Wooded CN=70 (sf)	Weighted CN	Pre Green Infrastructure "Base" acre ft	cf
DRYDET D												
SDE1	69025	0.002476	1.6	45	29	26	31352	20025	17648	80	0.053405026	2,326
SDW1	101616	0.003645	2.3	18	16	66	18630	15815	67171	75	0.050543618	2,202
DRYDETC												
SCE1	61634	0.002211	1.4	65	34	1	40361	20847	426	82	0.054325834	2,366
SCW1	39791	0.001427	0.9	59	30	11	23588	11789	4414	81	0.031335218	1,365
SCWWQ1	3149	0.000113	0.1	49	51	0	1557	1592	0	86	0.003954938	172
	42,940						25,145	13,381	4,414			1,537
DRYDETB												
SBE1	92932	0.003333	2.1	63	30	7	58520	28201	6211	81	0.074678126	3,253
SCVBE1	22934	0.000823	0.5	73	16	11	16759	3640	2535	77	0.011407331	497
	115,866						75,279	31,841	8,746			3,750
SBW1	44396	0.001592	1.0	71	23	6	31557	10079	2760	79	0.028080368	1,223
SBWWQ1	10502	0.000377	0.2	50	30	21	5199	3135	2168	80	0.008322964	363
SCVS14	20664	0.000741	0.5	66	12	21	13732	2499	4433	76	0.010278237	448
	75,562						50,488	15,713	9,361			2,034
DRYDETA												
SAE1	37718	0.001353	0.9	67	25	8	25451	9416	2851	80	0.025765974	1,122
SAW1	34216	0.001227	0.8	80	14	6	27294	4746	2176	77	0.017018978	741
SAWWQ1	12126	0.000435	0.3	65	25	10	7885	3089	1152	80	0.008421947	367
SCVS13	15820	0.000567	0.4	68	16	16	10827	2521	2472	77	0.00786884	343
	62,162						46,006	10,356	5,800			1,451
DSW DS-SO												
SS01	32323	0.001159	0.7	75	20	5	24144	6553	1626	79	0.018686878	814
SCVS12	14273	0.000512	0.3	68	19	14	9640	2644	1989	78	0.007692885	335
	46,596						33,784	9,197	3,615			1,149
DRYDETE												
SS11	30033	0.001077	0.7	74	20	6	22204	6082	1747	79	0.017347882	756
ADDTL TO SSF1												
SCVS11	32997	0.001184	0.8	74	16	10	24256	5353	3388	77	0.016412649	715
<i>Large upland Wooded area in SCVS22=72,606sf, subtracted</i>												
SCVS22	30714	0.001102	0.7	81	19	0	24822	5892	0	79	0.017007289	741
SCVS21	6388	0.000229	0.1	37	62	1	2355	3982	51	89	0.009707224	423
SS21	14810	0.000531	0.3	63	22	15	9265	3311	2234	79	0.009252602	403
	114,942						82,902	24,620	7,420			3,038
TOTALS		0.026116	16.71				429,398	171,211	127,452			
P:\Projects\03-2120\UMP Post Interl Review\2010 SWPPP WQv and Cn Weighting w Gl.xls\PR UD Tiers WQv												

										Print:	4/1/2011	
Table UD-2A Belleayre UMP/DEIS Stormwater Management System Calculations										Rev:	3/14/2011	
Location: Proposed UD Parking Area										Location: Proposed UD Parking Area		
Post-Development Conditions												
RRv Calculations: This table calculates RRv, Minimum RRv, and Summarized RRv Credits												
										(1) + (2)		
RRv Calculation Summarization												
Gross RRv Calculation Using 90% Storm					Minimum RRv Calculation (NYSSMSM10, pg 4-6)				RRv Summary and check Goal			
Subcatchment	Gross RRv (Acre-ft)	Gross RRv (cf)	Pre Porous Pvmpt Imperv Area, Aic (sf) (Restated)	Rv*	Minimum RRv With S-factor (cf)	Primary HSC	reduction HSG factor S	Targeted Imperv Area Ai = S x Aic (sf)	Total of RRv Reduction (Acre-ft)	% of RRv (%)	% of RRv Minimum (%)	RRv Min. is met (Y/N)
DRYDETD												
SDE1	0.047311897	2,061	20,025	0.95	618	C	0.3	6,008	2,682	130%	434%	Y
SDW1	0.037365176	1,628	15,815	0.95	488	C	0.3	4,745	2,559	157%	524%	Y
DRYDETC												
SCE1	0.049253989	2,146	20,847	0.95	644	C	0.3	6,254	2,748	128%	427%	Y
SCW1												
SCWWQ1												
	0.031614507	1,377	13,381	0.95	413	C	0.3	4,014	1,810	131%	438%	Y
DRYDETB												
SBE1												
SCVBE1												
	0.07522887	3,277	31,841	0.95	983	C	0.3	9,552	4,157	127%	423%	Y
SBW1												
SBWWQ1												
SCVS14												
	0.037124187	1,617	15,713	0.95	485	C	0.3	4,714	2,064	128%	426%	Y
DRYDETA												
SAE1	0.022246633	969	9,416	0.95	291	C	0.3	2,825	1,349	139%	464%	Y
SAW1												
SAWWQ1												
SCVS13												
	0.024467516	1,066	10,356	0.95	320	C	0.3	3,107	1,386	130%	433%	Y
DSW DS-SO												
SS01												
SCVS12												
	0.021729215	947	9,197	0.95	284	C	0.3	2,759	830	88%	292%	Y
DRYDETE												
SS11												
ADDTL TO SSF1												
SCVS11												
SCVS22												
SCVS21												
SS21												
	0.044247551	1,927	18,728	0.95	578	C	0.3	7,386	1,874	97%	324%	Y
TOTALS												
Sbtracted offsite 5,892sf impervious along 49A												

Table UD-2B Belleayre UMP/DEIS Stormwater Management System Calculations

Location: Proposed UD Parking Area

Location: Proposed UD Parking Area

Post-Development Conditions

Porous pavement RRV Calcs and DEP 20% impervious area criteria check

(1)

Porous Pavement Storage and Treatment Volume

Depth = Vol/(Aporous x Bed Porosity) NYSSMDM pg 5-122

Subtract Porous Pvmnt from Ttl that includes Conventional Pvmnt

DEP 20% Impervious Check

Subcatchment	Impervious Pavement Area to practice A, Impervious (sf)	Total Pavment Area contributing to practice A, Paved ttl (sf)	Porous Pavement + Gravel Edge to practice A, Porous Pvmnt (sf)	Area trib to Practice A, porous pvmnt (sf) (Restated)	WQv 90% from porous parking WQv (cf) (Restated)	WQv 1-yr from porous parking WQv (cf)	RRv credit for porous pkgng 100% (cf)	Gross A imperv to practice A impervious (sf) (Restated)	DEP % impervious to practice (#.##%)	Meets <20% Imperv (Y/N)
DRYDET D										
SDE1	0	20,025	20,732	20,732	2134		2,134	0	0.0	Y
SDW1	0	15,815	15,980	15,980	1645		1,645	0	0.0	Y
DRYDETC										
SCE1	0	20,847	21,596 (restated)	21,596	2223		2,223	0	0.0	Y
SCW1										
SCWWQ1	1,235	13,381	12,146	12,146	1250		1,250	1,235	2.9	Y
DRYDETB										
SBE1										
SCVBE1	6,573	31,841	25,268	25,268	2600		2,600	6,573	5.7	Y
SBW1										
SBWWQ1										
SCVS14	5,349	15,713	10,364	10,364	1067		1,067	5,349	7.1	Y
DRYDETA										
SAE1	0	9,416	9,716	9,716	1000		1,000	0	0.0	Y
SAW1										
SAWWQ1										
SCVS13	5,500	10,356	4,856	4,856	500		500	5,500	8.8	Y
DSW DS-SO										
SS01										
SCVS12	9,197	9,197	0	0	227		227	9,197	19.7	Y
DRYDETE										
SS11								See Subtotal	See Subtotal	See Subtotal
ADDTL TO SSF1										
SCVS11							
SCVS22							
SCVS21										
SS21	24,620	24,620	0	0	0		0	24,620	17.2	Y
TOTALS										
										OK, can subtract offsite 5,892sf impervious along

Table UD-2C Belleayre UMP/DEIS Stormwater Management System Calculations													Print:	4/1/2011	
Location: Proposed UD Parking Area													Rev:	3/14/2011	
Post-Development Conditions													Location: Proposed UD Parking Area		
DSW Sizing calculations - Pretreatment Forebay and DSW															
DSW Treatment Practice floor width alternatives															
Parking Area Filter Strip Pretreatment (FSP) considering parking area as conventional asphalt pavement						DSW Pretreatment sized for 10% WQv			For WQv 90%						
	Gross L, Parking (ft)	L, DSW along lot (ft)	L, DSW extension (ft)	A, Parking Terrace to FSP (sf)	WQv 90% from Parking (cf)	WQv 90% from all but Parking (cf)	V, DSW preterit 10% WQv (cf)	L, reqd. preterit @7.5 cf/lf (ft)	L, avail for 100% WQv (ft)	L, reqd 5' floor treatment @7.5 cf/lf (ft)	L, reqd 6.5' floor treatment @8.83 cf/lf (ft)	L, reqd 8' floor treatment @10.125 cf/lf (ft)	DSW Design Floor Width (ft)	% Parking in Subcat (%)	% Parking & Road in Subcat (%)
Subcatchment	(ft)	(ft)	(ft)	(sf)	(cf)	(cf)	(cf)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)	(%)
DRYDET															
SDE1	394	359	0	20732	2134	192	19.2	3	356	310.1	263.4	229.7	5	30	29
SDW1	306	271	0	15980	1645	557	55.7	7	264	n/a	249.4	217.5	6.5	15.7	15.6
DRYETC															
SCE1	410	375	0	21596	2223	143	14.3	2	373	315.5	268	233.7	5	35	33.8
SCW1	235	200	0	12146											
SCWWQ1	0	0	0	0											
	235	200	0	12146	1250	287	28.7	4	196	n/a	174.1	151.8	6.5	28.3	31.2
DRYETB															
SBE1	478	443	10	25268											
SCVBE1	0	0	0	0											
	478	443	10	25268	2600	1150	115	15	438	n/a	424.7	370.4	6.5	21.8	27.5
SBW1	202	167	88	10364											
SBWWQ1	0	0	0	0											
SCVS14	0	0	0	0											
	202	167	88	10364	1067	967	96.7	13	242	n/a	230.4	200.9	8	13.7	20.8
DRYETA															
SAE1	190	155	0	9716	1000	122	12.2	2	153	149.6	127.1	110.8	5	25.8	25
SAW1	100	65	117	4856											
SAWWQ1	0	0	0	0											
SCVS13	0	0	0	0											
	100	65	117	4856	500	951	95.1	13	169	n/a	164.3	143.3	8	7.8	16.7
DSW DS-SO															
Equations next lines differ for single lane road with no parking along DSW DSW-SO															
SS01	184	206	0	2208											
SCVS12	0	0	0	0											
	184	206	0	2208	227	922	92.2	12	194	153.2	130.1	113.5	6.5	4.7	19.7
DRYETE															
SS11														0	20.3
ADDTL TO SSF1															
SCVS11														0	16.2
SCVS22														0	19.2
SCVS21														0	62.3
SS21														0	22.4
TOTALS															
				0	0	3038									

Table UD-2D Belleayre UMP/DEIS Stormwater Management System Calculations

Location: Proposed UD Parking Area

Location: Proposed UD Parking Area

Post-Development Conditions
 DSW Storage Volume and RRV Credit
 Flow from 1-year CPv event stored and infiltrated in DSWs

DSW WQv 1-yr Storage - Following procedures in NYSSMDM Appendix B. Section B.1, pg B-1 - also applies to SSF

DSW Drawdown of 1-yr over 12 hrs

NRCS method to calc Qd

DSW Capacity for 1-yr Based WQv

Subcatchment	Weighted CN (non-parking)	la =(200/CN)-2 (in)	la/P	Taken from Model Tc (minutes)	Tc (hours)	qu, unit	qo/qi	Vs/Vr	A, to Practice (Acres)	Vs	Vs	Q underdrain	Q underdrain	Time to Dewater consider if needed (hr)	Qd, 1-yr	WQv for	WQv for	DSW Storage Volume 1ft Avg Depth Vol (cf)	Volume Subgrade Storage in soil voids (cf)	DSW	Override	
						peak dischg Go To Exhib 4-II (csm/in)	Go To Fig B.1 T=12 (unity)	Storage over (unity)		Storage Volume (Acre-ft)	Storage Volume (cf)	Reqd To Discharge over 12 hrs (cfs)	Reqd To Discharge over 12 hrs (cfh)		post devel runoff for design storm (in)	3.5" 1-yr Event (non-parking) (cf)	90% Event (non-parking) (cf)			Storage Vol for 1-1y WQv (+)+Extra or (-)-Shortage (cf)		DSW Design Floor Width (ft)
DRYDET D			(p=3.5)																			
SDE1	72	0.778	0.22	16.9	0.28	650	0.055	0.608	1.109	0.063	2740	0.0634	228.3	No Need	1.12	4507	192	2670	2181	2585	5	
SDW1	71	0.817	0.23	18	0.3	640	0.058	0.604	1.966	0.105	4569	0.1058	380.8	No Need	1.06	7565	557	2331	2102	212		
DRYDET C																						
SCE1	74	0.703	0.2	4.2	0.07	1000	0.035	0.634	0.919	0.060	2623	0.0607	218.6	No Need	1.24	4137	143	2798	2285	2958		
SCW1	73	0.74	0.21	10.4	0.17	800	0.04	0.627	0.913	0.056	2453				1.18							
SCWWQ1	86	0.326	0.09	1.3	0.02	1000	0.035	0.634	0.072	0.008	349				2.1							
	74	0.703	0.2								2802	0.0649	233.5	No Need	1.24	3182	287	1731	1561	748		
DRYDET B																						
SBE1	75	0.667	0.19	22.6	0.38	560	0.06	0.602	2.133	0.139	6061				1.3							
SCVBE1	77	0.597	0.17	8.4	0.14	875	0.038	0.63	0.526	0.040	1722				1.43							
	75	0.667	0.19								7783	0.1802	648.6	No Need	1.3	9815	1150	3868	3488	137		
SBW1	73	0.74	0.21	14.8	0.25	675	0.052	0.612	1.019	0.061	2672				1.18							
SBWWQ1	80	0.5	0.14	19.3	0.32	625	0.06	0.602	0.241	0.020	864				1.64							
SCVS14	76	0.632	0.18	12.6	0.21	725	0.05	0.614	0.474	0.033	1449				1.37							
	75	0.667	0.19								4985	0.1154	415.4	No Need	1.3	7063	967	2450	2372	137	8	
DRYDETA																						
SAE1	73	0.74	0.21	6.1	0.1	1000	0.035	0.634	0.643	0.040	1746	0.0404	145.5	No Need	1.18	2754	122	1148	937	555		
SAW1	74	0.703	0.2	5.1	0.09	1000	0.035	0.634	0.785	0.051	2242				1.24							
SAWWQ1	80	0.5	0.14	9.2	0.15	880	0.038	0.63	0.278	0.024	1044				1.64							
SCVS13	77	0.597	0.17	16.3	0.27	670	0.055	0.608	0.363	0.026	1146				1.43							
	76	0.632	0.18								4432	0.1026	369.3	0.8	1.37	6542	951	1711	2197	-308	8	
DSW DS-SO																						
SS01	77	0.597	0.17	10.3	0.17	820	0.04	0.627	0.742	0.055	2415				1.43							
SCVS12	78	0.564	0.16	7.2	0.12	940	0.37	0.337	0.328	0.014	601				1.5							
	77	0.597	0.17								3016	0.0698	251.3	No Need	1.43	5290	922	1713	1545	500	6.5	
DRYDETE																						
SS11	79	0.532	0.15	8.1	0.14	900	0.038	0.63	0.689	0.057	2475				1.57							
ADDTL TO SSF1																						
SCVS11	77	0.597	0.17	9.8	0.16	850	0.04	0.627	0.758	0.057	2465				1.43							
SCVS22	79	0.532	0.15	23.4	0.39	580	0.06	0.602	0.705	0.056	2419				1.57							
SCVS21	89	0.247	0.07	0.9	0.02	1000	0.035	0.634	0.147	0.018	796				2.36							
SS21	79	0.532	0.15	10	0.17	825	0.04	0.627	0.340	0.028	1215				1.57							
	79	0.532	0.15								9370				1.57	15038	3038					
TOTALS																						

Table UD-2E Belleaire UMP/DEIS Stormwater Management System Calculations

Location: Proposed UD Parking Area

Location: Proposed UD Parking Area

Post-Development Conditions

(2)

Subcatchment	Soil Perc Rate (in/hour)	DSW Unit Surf Area of WP above floor (sf/ff)	Unit Sideslope Exfiltration (cfs/ff)	Exfiltration from DSW Wetted Perimeter into sideslope soil			DSW Floor Drawdown k=3ft/day max				DSW Underdrain Discharge			Standard SMP with RRv credit for DSW		
				Total Sideslope Exfiltration (12 deep) (cfs)	Total Sideslope Exfiltration (6" deep avg) (cf/hr)	12 hour Total Sideslope Exfiltration (cf) (4)	Floor Infiltration Width/Area (sf/ff) (Restated)	Unit Floor Infiltration (cfs/ff)	Total Floor Infiltration (cfs)	Total Floor Infiltration (cf/hr)	12 hr Tti Floor Infiltration Capacity (cf)	Underdrain 6" Pipe DSW Discharge Capacity (cf/hr)	No. Hours Needed To Discharge and Exfiltrate Volume	RRv NYSSMSM TABLE 3.5 Credit (%)	SMP RRv Credit Allowable % of 90% Storm (non-parking) (cf)	SMP RRv Credit Allowable % of 1yr Storm (non-parking) (cf) 20% x (1)
DRYDET D																
SDE1	0.5	5.39	6.23843E-05	0.022	39.5	474	5	0.000173611	0.062	223	2676	415	N/R	20	38	548
SDW1	0.5	5.04	5.83333E-05	0.016	29	348	6.5	0.000225694	0.061	220	2640	400	N/R	20	111	914
DRYDETC																
SCE1	0.5	5.39	6.23843E-05	0.023	41.5	498	5	0.000173611	0.065	234	2808	435	N/R	20	29	525
SCW1																
SCWWQ	0.5	5.04	5.83333E-05	0.012	21.5	258	6.5	0.000225694	0.045	162	1944	297	N/R	20	57	560
DRYDETB																
SBE1																
SCVBE1	0.5	5.04	5.83333E-05	0.026	47	564	6.5	0.000225694	0.102	367	4404	664	N/R	20	230	1557
SBW1																
SBWWQ																
SCVS14	0.5	4.7	5.43981E-05	0.014	25	300	8	0.000277778	0.071	256	3072	452	N/R	20	193	997
DRYDETA																
SAE1	0.5	5.39	6.23843E-05	0.01	18	216	5	0.000173611	0.027	97	1164	178	N/R	20	24	349
SAW1																
SAWWQ																
SCVS13	0.5	4.7	5.43981E-05	0.01	18	216	8	0.000277778	0.051	184	2208	315	0.9	20	190	886
DSW DS-SO																
SS01																
SCVS12	0.5	5.04	5.83333E-05	0.012	21.5	258	6.5	0.000225694	0.046	166	1992	294	N/R	20	184	603
DRYDETE																
SS11																
ADDTL TO SSF1																
SCVS11																
SCVS22																
SCVS21																
SS21																
TOTALS														20	608	1874

**Sample WQv Calculation using Unified Stormwater Sizing
Using SCVS22 from above**

Given: 2239 WQv for particular subcatchment
 103320 sf A, site area
 2.372 acres A
 0.00370625 sm or mi² A
 5.702671312 % I, Impervious Cover
 1.3 in P, 90% Rainfall Event Number (see figure 4.1 NYSSMDM)

Find: 0.051393333 acre-ft WQv, Water Quality Volume
 2239 cubic ft WQv
 33 ft X*Y Dimensions of a 2-ft deep containment area

As Follows: 0.2 Rv, = 0.05+0.009(I), minimum equals 0.2

**Sample Peak flow calc, Qp=WQv, Peak Flow Calculation from NYSSMDM Appendix B
Using SCVS22 from above**

Find: 0.569 cfs Qp, Peak Discharge associated with Water Quality Volume
 (Per NYSSMDM App B, pg B-3)

As Follows: 0.26 watershed in. Qa=P x Rv= WQv in watershed inches
 83 CN
 0.41 in Ia= (200/CN) -2
 0.315 Ia/P
 0.27 hours Tc
 590 cfs/mi²/in qu, unit peak discharge, use Worksheet Chart from TR55 Exhibit 4-II (Type II) with Ia/p and Tc

**D, Vertical Low Flow Orifice Diameter Needed for WQv flow diversion to practice
Select as preliminary and use HCAD model Q10 event to size orifices to pass Qp's tabulated**

Find: 5.5 in D, Orifice Diameter needed with driving head below
 (vertical orifice equation)
 0.167 sf A, Orifice Area needed
 Using the Equation:
As Follows: Qp=cA*(2gh)^{0.5}
 0.6 Where:
 0.5 ft c is the orifice coefficient, typically 0.6
 h is the average driving head acting on the orifice, value based on diverter