Calc. By: NHC Date: 30-Nov-12
Chk. By: Date:

University Station
Westwood, MA

Drawdown Calculations

Drawdown Time

$$Time_{drawdown}{}^{1} = \frac{Rv}{(K)(Bottom\ Area)}$$

Where: $Time_{drawdown}$ = time it takes the basin to drain completely (hours)
Rv = storage volume (cubic feet)
K = saturated hydraulic conductivity (in/hour)
Bottom Area = bottom area of recharge structure (square feet)

Subsurface Infiltration Basin	Rv (cf)	K^2 (in/hr)	Bottom Area (sf)	Drawdown Time (hr)
1	97,182	7.5	61,050	2.5
2	53,317	9.25	18,500	3.7
3	34,325	4.13	21,120	4.7

Notes:
1.) Refer to Massachusetts Stormwater Handbook Volume 3, Chapter 1, page 25 dated February 2008.
2.) Refer to Massachusetts Stormwater Handbook Volume 3, Chapter 1, page 22 dated February 2008 (Rawls Rates Table).
3.) Refer to HydroCAD® report.

TETRA TECH RIZZO

Project: University Station
City: Westwood
State: MA

Proj. No: 127-3659-12003
Date: 11/29/2012
Comp: MKM
Check : AFT

Sediment Forebay Volume

Sediment Forebay Volume Required

**Based on MADEP requirement*

Calculation Summary

Required Sediment Forebay Volume

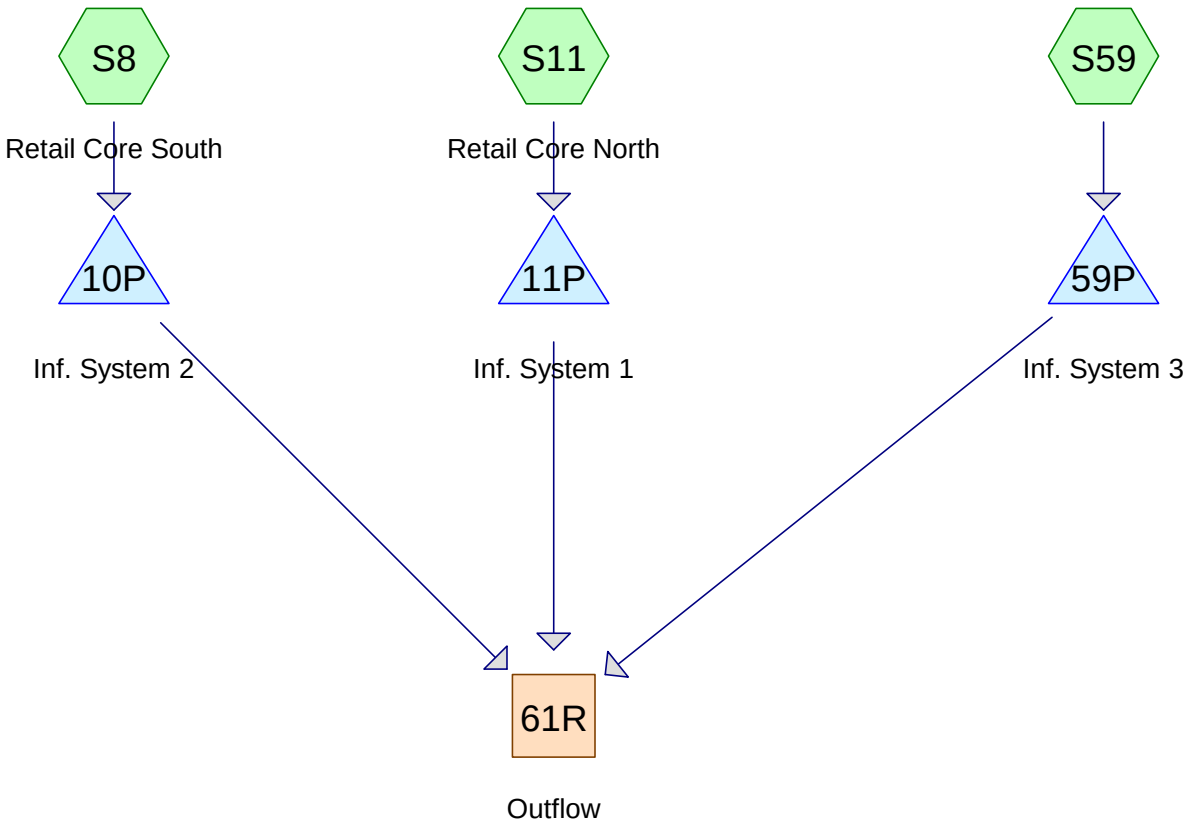
Forebay	Required Runoff Depth (in)	Proposed Impervious Area (AC)	Required Sediment Forebay Volume (CF)	Sediment Forebay Volume Provided (CF)
30F	0.10	18.82	6,830	7,012
52F	0.10	21.64	7,855	7,984
		Total	*14,684*	*14,996*

Storage Provided

(1) Total storage volume provided in Sediment Forebay 30F below overflow weir (elev=52.00) = 7,012 CF

(2) Total storage volume provided in Sediment Forebay 52F below overflow weir (elev=49.60) = 7,984 CF

(3) Cumulative storage volumes calculated using HydroCAD© watershed modeling program.



Subcat Reach Pond Link

Routing Diagram for 3659-12003C-Proposed Conditions Recharge Dynamic Calculation

Prepared by Tetra Tech Inc., Printed 11/29/2012

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.718	98	(S59)
38.203	98	Impervious (S11, S8)
46.921	**98**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
46.921	Other	S11, S59, S8
46.921		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	8.718	8.718		S59
0.000	0.000	0.000	0.000	38.203	38.203	Impervious	S11, S8
0.000	**0.000**	**0.000**	**0.000**	**46.921**	**46.921**	**TOTAL AREA**	

Time span=6.00-18.00 hrs, dt=0.05 hrs, 241 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S11: Retail Core North Runoff Area=589,497 sf 100.00% Impervious Runoff Depth>1.09"
Tc=5.0 min CN=98 Runoff=17.97 cfs 1.225 af

Subcatchment S59: Runoff Area=379,756 sf 100.00% Impervious Runoff Depth>1.09"
Tc=5.0 min CN=98 Runoff=11.58 cfs 0.789 af

Subcatchment S8: Retail Core Runoff Area=1,074,625 sf 100.00% Impervious Runoff Depth>1.09"
Tc=5.0 min CN=98 Runoff=32.76 cfs 2.234 af

Reach 61R: Outflow Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 10P: Inf. System 2 Peak Elev=47.55' Storage=17,170 cf Inflow=32.76 cfs 2.234 af
Discarded=10.72 cfs 2.231 af Primary=0.00 cfs 0.000 af Outflow=10.72 cfs 2.231 af

Pond 11P: Inf. System 1 Peak Elev=48.37' Storage=13,340 cf Inflow=17.97 cfs 1.225 af
Discarded=4.08 cfs 1.224 af Primary=0.00 cfs 0.000 af Outflow=4.08 cfs 1.224 af

Pond 59P: Inf. System 3 Peak Elev=47.83' Storage=10,387 cf Inflow=11.58 cfs 0.789 af
Discarded=2.05 cfs 0.788 af Primary=0.00 cfs 0.000 af Outflow=2.05 cfs 0.788 af

Total Runoff Area = 46.921 ac Runoff Volume = 4.248 af Average Runoff Depth = 1.09"
0.00% Pervious = 0.000 ac 100.00% Impervious = 46.921 ac

Summary for Subcatchment S11: Retail Core North

Runoff = 17.97 cfs @ 12.07 hrs, Volume= 1.225 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 6.00-18.00 hrs, dt= 0.05 hrs
Type III 24-hr Recharge Rainfall=1.42"

	Area (sf)	CN	Description
*	589,497	98	Impervious
	589,497		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S59:

Runoff = 11.58 cfs @ 12.07 hrs, Volume= 0.789 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 6.00-18.00 hrs, dt= 0.05 hrs
Type III 24-hr Recharge Rainfall=1.42"

	Area (sf)	CN	Description
*	379,756	98	
	379,756		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S8: Retail Core South

Runoff = 32.76 cfs @ 12.07 hrs, Volume= 2.234 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 6.00-18.00 hrs, dt= 0.05 hrs
Type III 24-hr Recharge Rainfall=1.42"

	Area (sf)	CN	Description
*	1,074,625	98	Impervious
	1,074,625		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 61R: Outflow

Inflow Area = 46.921 ac,100.00% Impervious, Inflow Depth = 0.00" for Recharge event
Inflow = 0.00 cfs @ 6.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 6.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 6.00-18.00 hrs, dt= 0.05 hrs

Summary for Pond 10P: Inf. System 2

Inflow Area = 24.670 ac,100.00% Impervious, Inflow Depth > 1.09" for Recharge event
Inflow = 32.76 cfs @ 12.07 hrs, Volume= 2.234 af
Outflow = 10.72 cfs @ 12.36 hrs, Volume= 2.231 af, Atten= 67%, Lag= 17.0 min
Discarded = 10.72 cfs @ 12.36 hrs, Volume= 2.231 af
Primary = 0.00 cfs @ 6.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 6.00-18.00 hrs, dt= 0.05 hrs
Peak Elev= 47.55' @ 12.36 hrs Surf.Area= 61,050 sf Storage= 17,170 cf

Plug-Flow detention time= 9.6 min calculated for 2.231 af (100% of inflow)
Center-of-Mass det. time= 9.1 min (747.1 - 738.0)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	72,188 cf	**Custom Stage Data (Prismatic)** Listed below Inside #2
#2	47.00'	123,750 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			381,563 cf Overall - 72,188 cf Embedded = 309,375 cf x 40.0% Voids
		195,938 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	11,550	0	0
48.00	11,550	11,550	11,550
49.00	11,550	11,550	23,100
50.00	11,550	11,550	34,650
51.00	11,550	11,550	46,200
52.00	11,550	11,550	57,750
53.00	11,550	11,550	69,300
53.25	11,550	2,888	72,188

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	61,050	0	0
48.00	61,050	61,050	61,050
49.00	61,050	61,050	122,100
50.00	61,050	61,050	183,150
51.00	61,050	61,050	244,200
52.00	61,050	61,050	305,250
53.00	61,050	61,050	366,300
53.25	61,050	15,263	381,563

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.00'	**7.500 in/hr Exfiltration over Surface area**
			Conductivity to Groundwater Elevation = 0.00'
#2	Primary	49.50'	**36.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=10.72 cfs @ 12.36 hrs HW=47.55' (Free Discharge)
↑—**1=Exfiltration** (Controls 10.72 cfs)

Primary OutFlow Max=0.00 cfs @ 6.00 hrs HW=47.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 11P: Inf. System 1

Inflow Area = 13.533 ac,100.00% Impervious, Inflow Depth > 1.09" for Recharge event
Inflow = 17.97 cfs @ 12.07 hrs, Volume= 1.225 af
Outflow = 4.08 cfs @ 12.47 hrs, Volume= 1.224 af, Atten= 77%, Lag= 23.6 min
Discarded = 4.08 cfs @ 12.47 hrs, Volume= 1.224 af
Primary = 0.00 cfs @ 6.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 6.00-18.00 hrs, dt= 0.05 hrs
Peak Elev= 48.37' @ 12.47 hrs Surf.Area= 18,500 sf Storage= 13,340 cf

Plug-Flow detention time= 19.8 min calculated for 1.224 af (100% of inflow)
Center-of-Mass det. time= 19.3 min (757.3 - 738.0)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	28,875 cf	**Custom Stage Data (Prismatic)** Listed below Inside #2
#2	47.00'	43,950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 138,750 cf Overall - 28,875 cf Embedded = 109,875 cf x 40.0% Voids
		72,825 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	3,850	0	0
48.00	3,850	3,850	3,850
49.00	3,850	3,850	7,700
50.00	3,850	3,850	11,550
51.00	3,850	3,850	15,400
52.00	3,850	3,850	19,250
53.00	3,850	3,850	23,100
54.00	3,850	3,850	26,950
54.50	3,850	1,925	28,875

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	18,500	0	0
48.00	18,500	18,500	18,500
49.00	18,500	18,500	37,000
50.00	18,500	18,500	55,500
51.00	18,500	18,500	74,000
52.00	18,500	18,500	92,500
53.00	18,500	18,500	111,000
54.00	18,500	18,500	129,500
54.50	18,500	9,250	138,750

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.00'	**9.250 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	49.50'	**36.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=4.08 cfs @ 12.47 hrs HW=48.37' (Free Discharge)
↑└**1=Exfiltration** (Controls 4.08 cfs)

Primary OutFlow Max=0.00 cfs @ 6.00 hrs HW=47.00' (Free Discharge)
↑└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 59P: Inf. System 3

Inflow Area = 8.718 ac,100.00% Impervious, Inflow Depth > 1.09" for Recharge event
Inflow = 11.58 cfs @ 12.07 hrs, Volume= 0.789 af
Outflow = 2.05 cfs @ 12.52 hrs, Volume= 0.788 af, Atten= 82%, Lag= 27.0 min
Discarded = 2.05 cfs @ 12.52 hrs, Volume= 0.788 af
Primary = 0.00 cfs @ 6.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 6.00-18.00 hrs, dt= 0.05 hrs
Peak Elev= 47.83' @ 12.52 hrs Surf.Area= 21,120 sf Storage= 10,387 cf

Plug-Flow detention time= 34.0 min calculated for 0.788 af (100% of inflow)
Center-of-Mass det. time= 33.1 min (771.1 - 738.0)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	36,960 cf	**Custom Stage Data (Prismatic)** Listed below x 2 Inside #2
#2	47.00'	31,680 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 116,160 cf Overall - 36,960 cf Embedded = 79,200 cf x 40.0% Voids
		68,640 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	3,360	0	0
48.00	3,360	3,360	3,360
49.00	3,360	3,360	6,720
50.00	3,360	3,360	10,080
51.00	3,360	3,360	13,440
52.00	3,360	3,360	16,800
52.50	3,360	1,680	18,480

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	21,120	0	0
48.00	21,120	21,120	21,120
49.00	21,120	21,120	42,240
50.00	21,120	21,120	63,360
51.00	21,120	21,120	84,480
52.00	21,120	21,120	105,600
52.50	21,120	10,560	116,160

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.00'	**4.130 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	48.50'	**24.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=2.05 cfs @ 12.52 hrs HW=47.83' (Free Discharge)
↑—**1=Exfiltration** (Controls 2.05 cfs)

Primary OutFlow Max=0.00 cfs @ 6.00 hrs HW=47.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Calc. By: NHC Date: 30-Nov-12
Chk. By: Date:

University Station
Westwood, MA

Groundwater Recharge Calculations

Required Recharge Volume[1]

Rv = F x impervious area

Where: Rv = required recharge volume (acre-feet)
F = target depth factor associated with each hydrologic soil group (inches)
Impervious Area = pavement, gravel and rooftop area on site (acres)

NRCS Hydrologic Soil Type	Approx. Soil Texture	Target Depth Factor (inches)	Impervious Area (acre)	Rv (acre-feet)	Rv (cf)
A	sand	0.60	84.30	4.215	183,605
B	loam	0.35	0.00	0.000	0
C	silty loam	0.25	0.00	0.000	0
D	clay	0.10	0.00	0.000	0
			Total =	**4.215**	**183,605**

Provided Recharge Volume[2]

Subsurface Infiltration Basin	Dynamic Recharge Volume (acre-feet)	Dynamic Recharge Volume (cf)
1	2.231	97,182
2	1.224	53,317
3	0.788	34,325
Total =	**4.243**	**184,825**

Notes:
1.) Refer to Massachusetts Stormwater Handbook Volume 3, Chapter 1, page 15 dated February 2008.
2.) Provided recharge volume is based on the Simple Dynamic Method, refer to Massachusetts Stormwater Handbook Volume 3, Chapter 1, page 19 dated February 2008.

Stage-Area-Storage for Pond 30F:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
49.00	1,520	0
49.05	1,545	77
49.10	1,571	155
49.15	1,596	234
49.20	1,621	314
49.25	1,647	396
49.30	1,672	479
49.35	1,697	563
49.40	1,723	649
49.45	1,748	735
49.50	1,774	823
49.55	1,799	913
49.60	1,824	1,003
49.65	1,850	1,095
49.70	1,875	1,188
49.75	1,900	1,283
49.80	1,926	1,378
49.85	1,951	1,475
49.90	1,976	1,573
49.95	2,002	1,673
50.00	2,027	1,774
50.05	2,056	1,876
50.10	2,085	1,979
50.15	2,113	2,084
50.20	2,142	2,190
50.25	2,171	2,298
50.30	2,199	2,407
50.35	2,228	2,518
50.40	2,257	2,630
50.45	2,286	2,744
50.50	2,315	2,859
50.55	2,343	2,975
50.60	2,372	3,093
50.65	2,401	3,213
50.70	2,430	3,333
50.75	2,458	3,455
50.80	2,487	3,579
50.85	2,516	3,704
50.90	2,544	3,831
50.95	2,573	3,959
51.00	2,602	4,088
51.05	2,634	4,219
51.10	2,666	4,351
51.15	2,699	4,486
51.20	2,731	4,621
51.25	2,763	4,759
51.30	2,795	4,898
51.35	2,827	5,038
51.40	2,860	5,180
51.45	2,892	5,324
51.50	2,924	5,470
51.55	2,956	5,617
51.60	2,988	5,765
51.65	3,021	5,915
51.70	3,053	6,067
51.75	3,085	6,221
51.80	3,117	6,376
51.85	3,149	6,532
51.90	3,182	6,691
51.95	3,214	6,851
52.00	3,246	7,012
52.05	3,282	7,175
52.10	3,317	7,340
52.15	3,353	7,507
52.20	3,388	7,675
52.25	3,424	7,846
52.30	3,460	8,018
52.35	3,495	8,192
52.40	3,531	8,367
52.45	3,566	8,545
52.50	3,602	8,724
52.55	3,638	8,905
52.60	3,673	9,088
52.65	3,709	9,272
52.70	3,744	9,459
52.75	3,780	9,647
52.80	3,816	9,837
52.85	3,851	10,028
52.90	3,887	10,222
52.95	3,922	10,417
53.00	**3,958**	**10,614**

Stage-Area-Storage for Pond 52F:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
47.00	2,135	0
47.05	2,169	108
47.10	2,203	217
47.15	2,237	328
47.20	2,271	441
47.25	2,305	555
47.30	2,339	671
47.35	2,373	789
47.40	2,407	908
47.45	2,441	1,030
47.50	2,475	1,153
47.55	2,509	1,277
47.60	2,543	1,403
47.65	2,577	1,531
47.70	2,611	1,661
47.75	2,645	1,793
47.80	2,679	1,926
47.85	2,713	2,060
47.90	2,747	2,197
47.95	2,781	2,335
48.00	2,815	2,475
48.05	2,854	2,617
48.10	2,892	2,760
48.15	2,931	2,906
48.20	2,970	3,053
48.25	3,009	3,203
48.30	3,047	3,354
48.35	3,086	3,508
48.40	3,125	3,663
48.45	3,163	3,820
48.50	3,202	3,979
48.55	3,241	4,140
48.60	3,279	4,303
48.65	3,318	4,468
48.70	3,357	4,635
48.75	3,396	4,804
48.80	3,434	4,975
48.85	3,473	5,147
48.90	3,512	5,322
48.95	3,550	5,499
49.00	3,589	5,677
49.05	3,632	5,858
49.10	3,675	6,040
49.15	3,717	6,225
49.20	3,760	6,412
49.25	3,803	6,601
49.30	3,845	6,792
49.35	3,888	6,986
49.40	3,931	7,181
49.45	3,974	7,379
49.50	4,017	7,578
49.55	4,059	7,780
49.60	4,102	7,984
49.65	4,145	8,190
49.70	4,188	8,399
49.75	4,230	8,609
49.80	4,273	8,822
49.85	4,316	9,037
49.90	4,358	9,253
49.95	4,401	9,472
50.00	**4,444**	**9,694**

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	N/A
Location	STC 1

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	15.87
Imperviousness (%)	82

The Stormceptor System model STC 11000 achieves the water quality objective removing 75% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 15.7 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	75
WQ Flow Rate (cfs)	15.7

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	25
STC 900	33
STC 1200	50
STC 1800	54
STC 2400	59
STC 3600	61
STC 4800	66
STC 6000	66
STC 7200	70
STC 11000	**75**
STC 13000	75
STC 16000	79

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	STC 2
Location	N/A

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	0.48
Imperviousness (%)	96

The Stormceptor System model STC 450i achieves the water quality objective removing 85% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 0.56 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	75
WQ Flow Rate (cfs)	0.56

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	**85**
STC 900	90
STC 1200	90
STC 1800	91
STC 2400	93
STC 3600	93
STC 4800	95
STC 6000	95
STC 7200	96
STC 11000	97
STC 13000	97
STC 16000	98

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	N/A
Location	STC 3

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	4.27
Imperviousness (%)	95.1

The Stormceptor System model STC 3600 achieves the water quality objective removing 75% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 4.91 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	75
WQ Flow Rate (cfs)	4.91

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	58
STC 900	69
STC 1200	69
STC 1800	69
STC 2400	74
STC 3600	**75**
STC 4800	79
STC 6000	79
STC 7200	82
STC 11000	86
STC 13000	86
STC 16000	89

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	N/A
Location	STC 4

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	1.07
Imperviousness (%)	95.3

The Stormceptor System model STC 450i achieves the water quality objective removing 75% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 1.23 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	75
WQ Flow Rate (cfs)	1.23

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	**75**
STC 900	83
STC 1200	83
STC 1800	84
STC 2400	87
STC 3600	88
STC 4800	90
STC 6000	91
STC 7200	92
STC 11000	94
STC 13000	94
STC 16000	95

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	N/A
Location	STC 5

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	1.68
Imperviousness (%)	95.2

The Stormceptor System model STC 900 achieves the water quality objective removing 79% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 1.94 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	75
WQ Flow Rate (cfs)	1.94

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	70
STC 900	**79**
STC 1200	79
STC 1800	79
STC 2400	83
STC 3600	84
STC 4800	87
STC 6000	87
STC 7200	90
STC 11000	92
STC 13000	92
STC 16000	94

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	N/A
Location	STC 6

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	4.58
Imperviousness (%)	74.7

The Stormceptor System model STC 450i achieves the water quality objective removing 61% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 4.14 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	50
WQ Flow Rate (cfs)	4.14

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	**61**
STC 900	71
STC 1200	71
STC 1800	71
STC 2400	76
STC 3600	76
STC 4800	80
STC 6000	81
STC 7200	84
STC 11000	87
STC 13000	88
STC 16000	90

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	N/A
Location	STC 7

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	37.46
Imperviousness (%)	36.9

The Stormceptor System model STC 1800 achieves the water quality objective removing 53% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 16.73 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	50
WQ Flow Rate (cfs)	16.73

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	23
STC 900	31
STC 1200	48
STC 1800	**53**
STC 2400	57
STC 3600	59
STC 4800	65
STC 6000	65
STC 7200	69
STC 11000	74
STC 13000	74
STC 16000	78

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	N/A
Location	STC 8

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	2.89
Imperviousness (%)	93.1

The Stormceptor System model STC 450i achieves the water quality objective removing 64% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 3.25 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	50
WQ Flow Rate (cfs)	3.25

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	**64**
STC 900	74
STC 1200	74
STC 1800	74
STC 2400	78
STC 3600	79
STC 4800	83
STC 6000	83
STC 7200	86
STC 11000	89
STC 13000	89
STC 16000	91

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	11/19/2012
Project Name	University Station
Project Number	N/A
Location	STC 9

Designer Information

Company	N/A
Contact	N/A

Notes

N/A

Drainage Area

Total Area (ac)	5.01
Imperviousness (%)	77.8

The Stormceptor System model STC 450i achieves the water quality objective removing 59% TSS for a Fine (organics, silts and sand) particle size distribution; providing continuous positive treatment for a stormwater quality flow rate of 4.72 cfs.

Rainfall

Name	BLUE HILL
State	MA
ID	736
Years of Records	1948 to 2005
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective

TSS Removal (%)	50
WQ Flow Rate (cfs)	4.72

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	**59**
STC 900	69
STC 1200	69
STC 1800	69
STC 2400	74
STC 3600	75
STC 4800	79
STC 6000	80
STC 7200	83
STC 11000	86
STC 13000	87
STC 16000	89

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
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University Station
Stormceptor Sizing Summary
November 30, 2012

STC #	Upstream DMH	Overal Tributary Area (ac)	Tributary Impervious Area (ac)	% Impervious	TSS Removal Target	Water Quality Design Depth	Time of Concentration	Impervious Area (sq mi)	qu	Water Quality Flow Rate (cfs)	STC Model #
1	DMH 31	15.87	13.01	82.0%	75.0%	1"	0.1	0.020328125	774	15.73	11000
2	DMH 102	0.48	0.46	95.8%	75.0%	1"	0.1	0.00071875	774	0.56	900
3	DMH 201	4.27	4.06	95.1%	75.0%	1"	0.1	0.00634375	774	4.91	3600
4	DMH 302	1.07	1.02	95.3%	75.0%	1"	0.1	0.00159375	774	1.23	900
5	DMH 401	1.68	1.60	95.2%	75.0%	1"	0.1	0.0025	774	1.94	900
6	DMH 507	4.58	3.42	74.7%	50.0%	1"	0.1	0.00534375	774	4.14	900
7	DMH 619	37.46	13.83	36.9%	50.0%	1"	0.1	0.021609375	774	16.73	1800
8	DMH 622	2.89	2.69	93.1%	50.0%	1"	0.1	0.004203125	774	3.25	900
9	DMH 707	5.01	3.90	77.8%	50.0%	1"	0.1	0.00609375	774	4.72	900

Tetra Tech Rizzo

Project: **Univsersity Station** By: **NHC** Date: **10/9/2012**

Location: **Westwood, MA** Chkd: **AFT** Date: **10/9/2012**

Watershed Area: **Point of Analysis 1**

TSS Removal Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Street Sweeping	0.05	1.00	0.050	0.95
Deep Sump/Hooded Catchbasins	0.25	0.95	0.238	0.71
Water Quality Structures	0.50	0.71	0.356	0.36
Extended Dry Detention Basin with Sediment Forebay	0.50	0.36	0.178	0.18

* Equals remaining load from previous BMP

Total TSS Removal = **82.2%**

Source: Volume Two: Massachusetts Stormwater Handbook, Dated January 2009 prepared by MADEP, Section VI Case studies.

Tetra Tech Rizzo

Project: **Univsersity Station** By: **NHC** Date: **11/30/2012**

Location: **Westwood, MA** Chkd: **AFT** Date: **11/30/2012**

Watershed Area: **Point of Analysis 2**

TSS Removal Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Street Sweeping	0.05	1.00	0.050	0.95
Deep Sump/Hooded Catchbasins	0.25	0.95	0.238	0.71
Water Quality Structures	0.75	0.71	0.534	0.18
Subsurface Infiltration Basin	0.80	0.18	0.143	0.04

* Equals remaining load from previous BMP

Total TSS Removal = **96.4%**

Source: Volume Two: Massachusetts Stormwater Handbook, Dated January 2009
prepared by MADEP, Section VI Case studies.

Tetra Tech Rizzo

Project: **Univsersity Station** By: **NHC** Date: **10/9/2012**

Location: **Westwood, MA** Chkd: **AFT** Date: **10/9/2012**

Watershed Area: **Point of Analysis 3**

TSS Removal Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Street Sweeping	0.05	1.00	0.050	0.95
Deep Sump/Hooded Catchbasins	0.25	0.95	0.238	0.71
Water Quality Structures	0.50	0.71	0.356	0.36
Extended Dry Detention Basin with Sediment Forebay	0.50	0.36	0.178	0.18

* Equals remaining load from previous BMP

Total TSS Removal = **82.2%**

Source: Volume Two: Massachusetts Stormwater Handbook, Dated January 2009
prepared by MADEP, Section VI Case studies.

Tetra Tech Rizzo

Project: **Univsersity Station** By: **NHC** Date: **10/9/2012**

Location: **Westwood, MA** Chkd: **AFT** Date: **10/9/2012**

Watershed Area: **Point of Analysis 4**

TSS Removal Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Street Sweeping	0.05	1.00	0.050	0.95
Deep Sump/Hooded Catchbasins	0.25	0.95	0.238	0.71
Water Quality Structures	0.50	0.71	0.356	0.36
Subsurface Infiltration Basin	0.80	0.36	0.285	0.07

* Equals remaining load from previous BMP

Total TSS Removal = **92.9%**

Source: Volume Two: Massachusetts Stormwater Handbook, Dated January 2009
prepared by MADEP, Section VI Case studies.