

The Reserve at Tinner Hill
Falls Church, VA
Stormwater Treatment System - Design Summary

May 2nd, 2013

Information provided:

Structure ID	Area (ac)	% Impervious	C	Water Quality Flow (cfs)	10 Year Peak Flow (cfs) 1 = 7.27"/hr
12	1.10	100	0.90	0.346	7.19
		13			

- Presiding agency = VDCR
- Design Criteria:**
 - Design storm = Modified Rational method
 - Rainfall intensity = 0.35 in/hr (currently accepted by the VDCR)
 - Media = Zeolite/Perlite/GAC
 - Head Requirement (Operating Head-Outlet Elevation) = 33" for 27" Cartridges, 24" for 18" Cartridges, 18" for 18" Low-Drop Cartridges
 - Cartridge Operating Flow @ 2 gpm/sf = 22.5 gpm (27"), 15 gpm (18"), 10 gpm (18" Low-Drop)

Size estimates:

The Stormwater Management StormFilter® is a passive, siphon-actuated, flow-through stormwater filtration system consisting of a structure that houses rechargeable, media-filled filter cartridges. The StormFilter works by passing stormwater through the media-filled cartridges, which trap particulates and adsorb pollutants such as dissolved metals, nutrients, and hydrocarbons. The StormFilter system is VDCR verified and as a result has received approval for 80% TSS and 50% TP removal (65% TP Removal in some locations).

The StormFilter is a flow-based system utilizing cartridges flowing at 2 gpm/ft² of filter media. The system is sized by calculating the peak water quality flow rate associated with the design storm. The water quality flow rate was calculated using the Modified Rational Method assuming a rainfall intensity of 0.35 inches per hour.

Given the information above the treatment flow rate was determined to be:

$$12$$

$$Q_{flow} = C \cdot I \cdot A = 0.90 \times 0.35 \frac{in}{hr} \times 1.10 \text{ acres} = 0.346 \text{ cfs}$$

$$N_{cartridges} = \frac{Q_{flow} \times 449 \frac{gpm}{cfs}}{S_{A_{cartridge}} \times Q_{operating}} = \frac{0.346 \text{ cfs} \times 449 \frac{gpm}{cfs}}{7.50 \text{ ft}^2 \times 2 \frac{gpm}{ft^2}} = 10.35 \rightarrow \text{use (11) 18" cartridges}$$

To accommodate the treatment flow rate of 0.346 cfs, Contech Engineered Solutions recommends using a 6'x12' Peak Diversion StormFilter with (11) 18" tall cartridges. The 18" tall cartridge contains 7.50 square feet of media and a radial media depth of seven inches. The estimated cost of this system, complete and delivered to the job site, is available upon request. The contractor is responsible for setting the StormFilter vault and all external piping.

The Peak Diversion StormFilter configuration features internal bypass, so upstream bypass and downstream junction manholes are not needed.

605 Global Way, Suite 113, Linthicum, MD 21090
Tel-free: 866.740.3318 Fax: 866.376.8511
Provided by CONTECH on: 5/2/2013

Maintenance:

The StormFilter requires regular maintenance to operate effectively. Contech recommends annual inspections, with full maintenance typically required every 24-36 months. Disposal of material should be handled in accordance with local regulations. Please contact Contech's Maintenance Department for all questions regarding maintenance at 866-740-3318 or visit our website at www.contechES.com

STORMFILTER INSTALLATION NOTE

CONTRACTOR TO CONTACT CONTECH AT LEAST 3 WEEKS PRIOR TO INSTALLATION IN ORDER TO REQUEST THAT A REPRESENTATIVE BE ON HAND DURING THE STORMFILTER INSTALLATION. FURTHERMORE, THE CONTRACTOR SHALL REQUEST THAT A CONTECH REPRESENTATIVE ENSURE THAT THE STORMFILTER IS OPERATING AS DESIGNED AT THE END OF THE CONSTRUCTION PERIOD. CONTRACTOR TO REQUEST THAT CONTECH PROVIDE A WRITTEN CERTIFICATION TO THE CITY OF FALLS CHURCH THAT THE STORMFILTER IS OPERATING PROPERLY AND AN ESTIMATE OF THE REMAINING CAPACITY BEFORE THE FILTER CARTRIDGES REQUIRE CHANGING. IN ORDER TO ENSURE THAT THE STORMFILTER DOES NOT GET CLOGGED DURING CONSTRUCTION, THE STORMFILTER SYSTEM HAS A CONSTRUCTION FLOW BYPASS. THIS BYPASS IS TO BE UTILIZED UNTIL THE END OF CONSTRUCTION AND THE SITE HAS BEEN PERMANENTLY STABILIZED.

A BEST MANAGEMENT PRACTICE MAINTENANCE AGREEMENT IS TO BE DRAFTED FOR THE STORM FILTER SYSTEM AND SUBMITTED TO THE CITY OF FALLS CHURCH.

ONSITE BMP FACILITY (STRUCTURE 13)
(PRIVATELY OWNED AND MAINTAINED)

The Reserve at Tinner Hill
Falls Church, VA
Stormwater Treatment System - Design Summary

May 13th, 2013

Information provided:

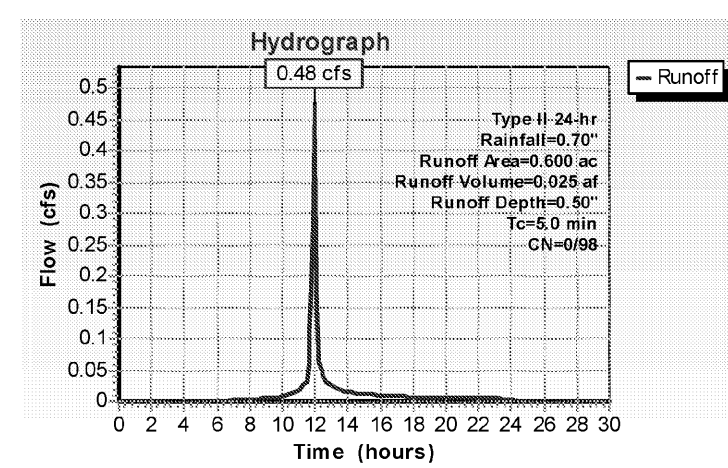
Site ID	Area (ac)	Tc (min)	C	10-Yr Peak Flow (cfs)
9	0.60	5	0.89	3.88

- Presiding agency = VDCR
- Assumptions:**
 - Design storm = Type II 24-hr yielding 0.5" of runoff
- Size estimates:**

The In-line CDS Unit is placed on the main storm drain within one manhole. This system's unique configuration meets multiple engineering objectives by combining both treatment and bypass capabilities in one structure. By utilizing CDS' patented non-blocking screening technology, the In-line Unit ensures removal of both fine and suspended solids along with oil, grease, trash and debris. Offering a remarkably small footprint, this system can be incorporated into new development projects or retrofitted into existing storm water collection systems. It can also be fitted with an inlet grate to accept surface flow.

The CDS is a flow-based system, and therefore, is sized by calculating the peak water quality flow rate associated with the design storm. The design storm precipitation depth which yields the first 0.5" of runoff was selected (per chapter 5 of the VA SWM Handbook). The water quality flow rate was calculated assuming 0.7" of rainfall in 24 hours and a Type II rainfall distribution, to yield 0.5" of runoff over the impervious area. The pervious area proves to be negligible to the water quality flow during the first 0.7" of rainfall.

Structure 9



605 Global Way, Suite 113, Linthicum, MD 21090
Tel-free: 866.740.3318 Fax: 866.376.8511

Site ID	Calculated 0.50" Water Quality Flow (cfs)	Recommended CDS Model
9	0.48	CDS2015-4

The estimated cost of these systems, complete and delivered to the job site, is available upon request. The contractor is responsible for installing the CDS units and all external piping.

Maintenance:

Like any stormwater best management practice, the CDS system requires regular inspection and maintenance to ensure optimal performance. Maintenance frequency will be driven by site conditions. Quarterly visual inspections are recommended, at which time the accumulation of pollutants can be determined. On average, the CDS system requires annual removal of accumulated pollutants. Please contact Contech or navigate to www.contechES.com for more information in this regard.

CDS INSTALLATION NOTE

CONTRACTOR TO CONTACT CONTECH AT LEAST 3 WEEKS PRIOR TO INSTALLATION IN ORDER TO REQUEST THAT A REPRESENTATIVE BE ON HAND DURING THE CDS INSTALLATION. FURTHERMORE, THE CONTRACTOR SHALL REQUEST THAT A CONTECH REPRESENTATIVE ENSURE THAT THE CDS IS OPERATING AS DESIGNED AT THE END OF THE CONSTRUCTION PERIOD. CONTRACTOR TO REQUEST THAT CONTECH PROVIDE A WRITTEN CERTIFICATION TO THE CITY OF FALLS CHURCH THAT THE CDS IS OPERATING PROPERLY AND AN ESTIMATE OF THE REMAINING CAPACITY BEFORE THE SUMP REQUIRES CLEANING. IN ORDER TO ENSURE THAT THE CDS DOES NOT GET CLOGGED DURING CONSTRUCTION, THE CDS STRUCTURE SHALL REMAIN OFFLINE UNTIL THE END OF CONSTRUCTION AND THE SITE HAS BEEN PERMANENTLY STABILIZED.

OFFSITE BMP FACILITY (STRUCTURE 9)
(PUBLICLY OWNED AND MAINTAINED)

BEST MANAGEMENT PRACTICES DETAILS

THE RESERVE
AT TINNER HILL
CITY OF FALLS CHURCH, VIRGINIA

Engineers • Surveyors • Planners
Landscape Architects • Arborists

WALTER L. PHILLIPS
INCORPORATED
ESTABLISHED 1945

207 PARK AVENUE
FALLS CHURCH, VIRGINIA 22046
(703) 532-6163 Fax (703) 533-1301
www.WLPHINC.com

DATE: 02/20/13
SCALE: 1" = 20'

NO.	DESCRIPTION	DATE	APPROVED BY	REVISION