

# GREEN ROOFS FOR STORMWATER MANAGEMENT Maryland

## Maryland Specific Stormwater Calculations and Details

Columbia Green Technologies provides AutoCAD details and stormwater calculations that are specifically designed with Maryland's stormwater regulations in mind. Through our technical support we strive to make designing and implementing a green roof in Maryland as easy as possible. Maryland specific details can be downloaded from <http://columbia-green.com/resources/regional-stormwater-information/> along with Stormwater Regulation Sheets for other areas of the country.

## Policies and Regulations in Maryland

### Stormwater Requirements

The stormwater regulations in Maryland are triggered by developments that disturb over 5000 ft<sup>2</sup> of land. In order to limit the negative impacts of stormwater runoff the State of Maryland developed 14 General Performance Standards.

In part, the standards require that groundwater be recharged through infiltration to pre-development levels. Under the Water Quality Volume requirement developers must retain and treat 90% of the average annual rainfall. Additionally BMPs should be designed to remove 80% of Total Suspended Solids and 40% of phosphorus from that runoff. In order to protect stream and riverbanks from erosion the Channel Protection requirement requires the extended detention of runoff from a one-year, 24 hour design storm. A complete list of General Performance Standards is available in Chapter 1 of the Stormwater Manual and in the Maryland Municipal Code.

For more information go to <http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram>

Columbia Green Technologies green roofing systems can retain up to 70% of annual rainfall, making them an effective way of fulfilling the Channel Protection Standard. Additionally green roofs reduce a site's impervious area, lowering the required Water Quality Volume.

### Environmental Site Design

In order to better protect natural resources and maintain predevelopment runoff levels Maryland implemented the Environmental Site Design (ESD) strategy. ESD practices should be used to retain and treat the runoff from 1" of rainfall over the site area. ESDv is the volume of stormwater that must be retained and treated to meet the minimum requirements.

$$ESDv = \frac{[(P_e)(R_v)(A)]}{12}$$

ESDv = runoff volume in ft<sup>3</sup>  
 P<sub>e</sub> = Rainfall Target in inches, values available in Table 5.3 in Stormwater Manual  
 R<sub>v</sub> = volumetric runoff coefficient, R<sub>v</sub> = 0.05 + 0.009(I)  
 where I is % impervious cover  
 A = drainage area ft<sup>2</sup>

Green roofs are considered an alternate surface to reduce impervious area. Green roofs are assigned a RCN value based on the depth of growing media that shows how a green roof will contribute to the ESD sizing criteria.

Thickness (inches)	2	3	4	6	8
Effective RCN	94	92	88	85	77

The Stormwater Management Act of 2007 requires that ESD be implemented to the maximum extent possible. Columbia Green can help develop an effective ESD plan with a variety of tray and layer based green roof solutions with medium depths from 4" to over a foot, and offering technical support from the design phase to after implementation.

## Local Green Roof Incentive Programs

Montgomery County funds the Rainscapes Rewards Program that offers rebates up to \$10,000 to property owners to install approved stormwater management controls.

For more information go to <http://www.montgomerycountymd.gov/dep/water/rainscapes-rebates.html>

The Anne Arundel County Stormwater Management Tax Credit provides a property tax credit of 10% the cost of an approved stormwater management practice, taken per year for 5 years, to a maximum total of \$10,000.

For more information go to <http://www.aacounty.org/DPW/Highways/Resources/Raingarden/SWMTaxCreditFAQ.pdf>

## About Columbia Green Technologies

At Columbia Green Technologies we offer a variety of comprehensive green roof solutions; from extensive to intensive green roofs, available with both tray based and layered systems. Designers appreciate the flexibility our systems offer and the technical support that accompanies any project we undertake. Building owners love the single-source 'Roof to Green Roof' warranty options provided through our roofing partners.



[www.columbia-green.com](http://www.columbia-green.com)

503-327-8723

[info@columbia-green.com](mailto:info@columbia-green.com)

Note: This summary has been prepared and compiled by Columbia Green Technologies for informational purposes only. The information contained herein is accurate to the best of our knowledge as of Spring/Summer 2014. Please consult the regulatory agency and/or a licensed engineer before using this information for the purposes of facility design or permitting.