

RiverSmart Communities: Best Management Practice (BMP) Guide

The RiverSmart Communities program will be funding stormwater retrofits projects on District properties such as condominiums, apartments, churches, and small businesses. The types of practices to be funded include, but are not limited to, cisterns, rain gardens, pervious pavement, dry wells, turf removal, conservation landscaping, and shade tree installations. One property can have more than one of the above practices implemented.

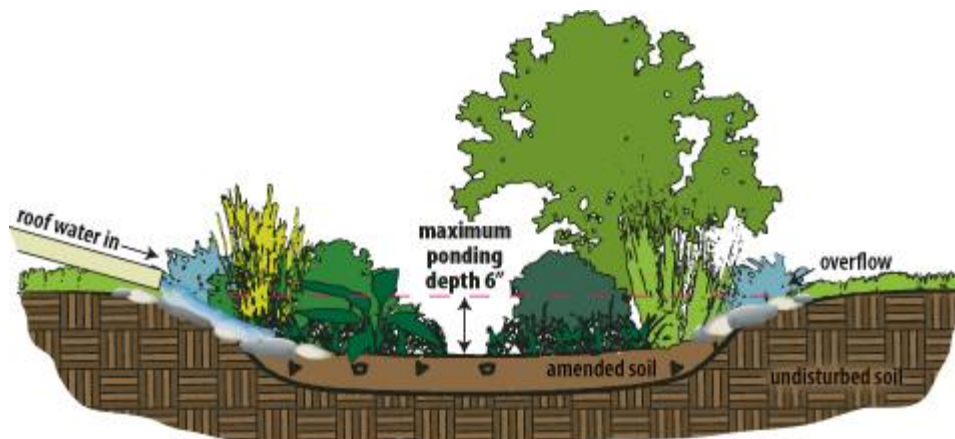
If your application team is unfamiliar with the above practices and need assistance in identifying or siting potential projects, please use the following guide to assist in drafting your proposal.

Rain Gardens

Bioretention areas, or rain gardens, are landscaping features adapted to provide on-site treatment of stormwater runoff. Rooftop or surface runoff is directed into shallow, landscaped depressions which allow water to pause and infiltrate into the ground. During storms, runoff ponds above the mulch and soil in the system, but the gardens are designed to drain completely within 24-48 hours. Runoff from larger storms is generally diverted past the facility to the storm drain system. In some cases, the filtered runoff can be collected in a perforated underdrain and returned to the storm drain system.

Rain gardens are able to infiltrate a great deal of water. This makes rain gardens an excellent way to keep water out of local streams and rivers but may also pose problems if the rain gardens are not installed in the correct location. Rain gardens should only be installed if there is a 2% to 10% slope away from the building and it needs to be at least 10 feet from the foundation.

Cross Section of a Rain Garden (without underdrain):



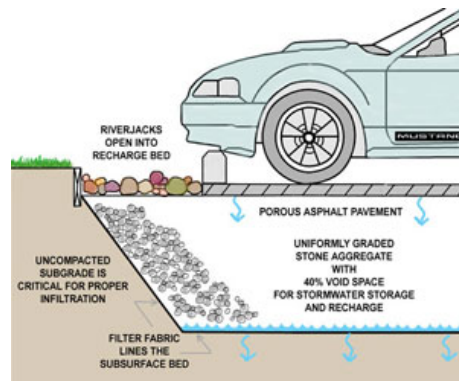
<http://www.oeconline.org/event-content-items/rain-gardens-landscaping-for-clean-water-and-healthy-streams-train-the-trainers-workshop>

Additional Resources on Rain Gardens:

- **EPA:**
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=72
- **Low Impact Development Center:**
http://www.lowimpactdevelopment.org/raingarden_design/links.htm#Define_rain_garden
- **State of Maryland:**
<http://www.rainscaping.org/index.cfm/fuseaction/home.showpage/pageID/5/index.htm>
- **State of Virginia Department of Forestry:**
http://www.dof.virginia.gov/mgt/resources/pub-Rain-Garden-Tech-Guide_2008-05.pdf

Pervious Pavement

Pervious pavement includes a number of pavement material and techniques that provide the functionality of traditional pavement systems while still allowing water to infiltrate into the ground. Pervious pavement systems have void spaces that allow water to pass through the pavement into a layer of aggregate, then infiltrate into the ground. Pervious pavement reduces stormwater runoff rates and volume, filters pollutants, and recharges groundwater. Pervious pavement is less likely to crack or buckle from freeze/thaw cycles.



<http://www.wbdg.org/resources/lidtech.php>

Additional Resources for Pervious Pavement:

- EPA: (Permeable Interlocking Concrete Pavement)
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=136&minmeasure=5
- EPA: (Pervious Concrete)
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=137&minmeasure=5
- EPA: (Pervious Asphalt)
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=135&minmeasure=5
- Low Impact Development Center:
http://www.lid-stormwater.net/permcomind_home.htm

Cisterns

Cisterns collect rain water from impervious surfaces such as rooftops and parking lots and store it for later use in non-potable applications like irrigation. Cisterns are a cost effective way to reduce the volume and decrease the peak flow rates of water entering the storm sewer system. Having a use for the water collected is an important component to installing a successful cistern system. To function optimally, the cistern should be empty at the start of each rain. We recommend the cistern is placed such that it can be easily emptied into a vegetated area.



<http://www.sunset.com/garden/earth-friendly/rainwater-savers-00400000038661/page3.html>

- Water Environment Federation:
<http://www.werf.org/livablecommunities/toolbox/rainbarrel.htm>
- Low Impact Development Center:
http://www.lid-stormwater.net/raincist_sizing.htm

Conservation Landscaping (BayScaping)

BayScaping is a stormwater-friendly alternative to turf grass. Turf grass has short, compact roots and tends to have very low permeability. Most of the rain that hits turf grass eventually runs off and becomes stormwater pollution. Native plant species have roots that reach up to 18” and can greatly improve the permeability of the soil. Conservation landscaping is best used in conjunction with other practices such as cisterns and rain gardens.

- U.S. Fish and Wildlife Service:
<http://www.fws.gov/chesapeakebay/BayScapes/bswhy/bs-why.htm>
<http://www.nps.gov/plants/pubs/chesapeake/pdf/chesapeakenatives.pdf>
- EPA:
<http://www.fws.gov/chesapeakebay/bayscapes/bsresources/bs-resources.htm>