



LOW IMPACT DEVELOPMENT CHECKLIST FOR HAMPTON ROADS

DEFINITION: Low Impact Development (LID) is a stormwater management approach that minimizes the hydrological impact of development by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

BACKGROUND: Virginia has adopted revised stormwater regulations that will be implemented by local governments beginning July 1, 2014. These regulations encourage LID through use of the runoff reduction method to reduce the impacts of development on water quality. This checklist is intended to help developers implement LID principles and reduce the cost of compliance with the stormwater regulations.

Follow these four steps to comply with Virginia's new Stormwater Regulations:

- 1 Use Environmental Site Design Principles to minimize impervious area and preserve forest and open space.
- 2 Apply runoff reduction practices.
- 3 Add pollutant removal practices to meet water quality goals if necessary.
- 4 Add additional BMPs to meet channel protection and flood control requirements.

1. ENVIRONMENTAL SITE DESIGN

Employing the steps below will allow the developer to reduce the post development nutrient load for the site, thereby reducing the amount of nutrients that need to be reduced using expensive structural BMPs.

12 STEPS OF ENVIRONMENTAL SITE DESIGN

Practices		Yes	No	N/A
1	Conduct environmental mapping of site prior to layout.			
2	Conserve natural areas (forest, wetlands, steep slopes, and floodplains).			
3	Preserve stream, wetland, and shoreline buffers.			
4	Minimize disturbance of permeable soils.			
5	Maintain natural flow paths across site.			
6	Layout buildings to reduce clearing and grading of site.			
7	Grade site to promote sheet flow from impervious areas to pervious areas.			
8	Reduce impervious area.			
	Use minimum required width for roadways.			
	Utilize pervious pavements for parking and pedestrian areas.			
9	Maximize disconnection of impervious cover.			
10	Identify potential hotspot generating areas for stormwater treatment.			
11	Integrate erosion and sediment control practices and post construction stormwater management practices into a comprehensive site plan.			
12	Use tree planting to convert turf areas into forest.			

2. RUNOFF REDUCTION PRACTICES

These practices reduce the volume of runoff leaving a site and can also be credited towards the channel protection and flood control requirements. Implementing the practices below first will maximize the nutrients removed by the stormwater management practices because they reduce runoff and remove pollutants.

The Table below indicates which practices are appropriate for use in the Hampton Roads area. Specifications for these practices and coastal plain modifications can be found at the BMP Clearinghouse. Developers should also consult the public facilities manual of the applicable local government for additional restrictions.

Runoff Reduction Practices	Preferred	Accepted	Restricted	Level 1 Efficiency (%)	Level 2 Efficiency (%)	Level 2 Available in Hampton Roads
Rooftop Disconnection	X			25	50	A&B Soils/ CA ¹
Sheet flow to open space	X			50	75	A&B Soils
Grass Channels			X	24	30/40	A&B Soils/ CA ¹
Vegetated Roofs		X		45	60	Yes
Rainwater Harvesting	X			Up to 90	NA	NA
Permeable Pavement	X			59	81	Limited
Infiltration		Small Scale	Large Scale	63	93	Limited
Bioretention	X			55	90	Limited
Dry Swales	X			52	76	Limited

¹Compost Amendments

3. POLLUTANT REMOVAL PRACTICES

If implementation of environmental site design principles and runoff reduction practices do not meet the stormwater regulations phosphorus target, then pollutant removal practices will need to be implemented. The Table below identifies the practices appropriate for use in the Hampton Roads area. Specifications for these practices and coastal plain modifications can be found at the BMP Clearinghouse.

Pollutant Removal Practices	Preferred	Accepted	Restricted	Level 1 Efficiency (%)	Level 2 Efficiency (%)	Level 2 Available in Hampton Roads
Wet Swales	X			20	40	Yes
Filtering Practices		X		60	65	Limited
Constructed Wetlands	X			50	75	Yes
Wet Ponds		X		45	65	Yes
Extended Detention Ponds			X	15	31	Limited

4. CHANNEL PROTECTION AND FLOOD CONTROL PRACTICES

If implementation of the runoff reduction practices does not meet the channel protection and flood control requirements, then additional practices will need to be constructed or pollution prevention practices will need to be modified to provide additional retention for quantity control.

RESOURCES:

Virginia Stormwater Management Handbook: http://www.dcr.virginia.gov/laws_and_regulations/lr2i.shtml

Virginia Stormwater Management BMP Clearinghouse Standards and Specifications: <http://vwrrc.vt.edu/swc/NonProprietaryBMPs.html>

Virginia Runoff Reduction Method Compliance Spreadsheet: http://www.dcr.virginia.gov/laws_and_regulations/lr2f.shtml