

---

# ENVIRONMENTAL SITE DESIGN

---

*Gaining the Benefits of Growth While Keeping Waters Safe for People & Aquatic Life*

---

Environmental Site Design (ESD) is a comprehensive approach to developing the land which encourages a compact design that minimizes runoff, forest loss, erosion and other impacts. Prior to Maryland's adoption of ESD in 2007, builders would place a pond and a runoff filter at the lowest point on a site. These measures would remove a third to half the pollution washed from rooftops, streets, parking lots and other *impervious* surfaces. For several reasons these measures performed poorly, prevented little pollution, and had a high failure rate.

## ESD Measures

### Mimic Forest Pollutant Removal

ESD measures, like the Rain Garden pictured here, are spread throughout the site, which reduces failure and better preserves aquatic resources. ESD measures replicate how a forest creates extremely high quality water. Up to 90% of all runoff is stored in the depressed surface of the ESD measure until it can soak through a layer of wood mulch then two- or three-feet of a sand-organic matter mix resembling planting soil. Passage through these layers removes 70% - 95% of the pollutants washed from impervious surfaces. The high-quality filtered runoff is then released into the earth where it emerges weeks or years later as cold, clean spring flow into a nearby wetland or waterway.

### All Impervious Runoff Must Flow To ESD Practices

There are 15 ESD practices. Maryland law requires that proposed development plans show that impervious surface runoff will flow to one or more of these 15 practices. If this is not possible, then the designer is required to consider options such as scaling back the number of houses, commercial floor space, etc. to make sufficient room so all runoff is treated with ESD measures. However, these scale-backs rarely occur.



**Rain Garden In Front Of A Home**

### Third To Half of a Watershed Must Be In Forest

A central component of ESD is maximizing the amount of forest retained on each development site. However, Maryland never adopted any specific requirements that obligated the designed to save more than the 15%-20% of woodland dictated by the Maryland Forest Conservation Act. To put this in perspective, consider that a minimum of 45% of a watershed should remain in forest to preserve water supply reservoirs and to safeguard trout as well as other sensitive species. At least 37% forest cover is needed to maintain the human uses of suburban-urban neighborhood waters.

### Compliance With ESD Runoff Treatment Spotty

It is mostly county and city governments which are responsible for ensuring that each proposed development project fully complies with ESD requirements. Recent studies showed Montgomery County is achieving a 95% compliance rate for the requirement that all impervious surfaces drain to ESD practices, while Baltimore County has a 27% compliance rate. Most Maryland counties issued about a dozen ESD waivers while Baltimore County has granted 371.

### No Jurisdiction Is Saving Enough Forest

No Maryland jurisdiction appears to be requiring builders to preserve more than the 15%-20% of forest normally required for suburban-urban sites. And in a number of jurisdictions even this minimum forest preservation is waived in suburban-urban watershed where forest is most needed. However, a coalition of organizations has formed in Montgomery County to push for greater forest preservation as part of the ESD review process. For further detail visit our Environmental Site Design webpage: [ceds.org/esd](http://ceds.org/esd)

# SOME OF THE MORE COMMON ESD PRACTICES



**Bioretention with Mulch**



**Bioretention with Grass**



**Dry (Bio) Swale**



**Rain Garden**



**Sand Filter**



**Permeable Pavement**