



Facts About: Alternative Surfaces

Stormwater Best Management Practices (BMPs)

Pavement and roofs are impervious surfaces that water cannot filter through. Without filtration, there is an increased volume of water running off these surfaces with more pollutants, increased temperatures, and less water filtering back down to recharge groundwater. An effective method to reduce imperviousness in residential, commercial, and industrial applications is to use more permeable alternatives.

Green Roof

A **green roof** is a multi-layered system of waterproof liner, insulation, gravel, soil, and plants. There are two types of green roofs. **Extensive green roofs** typically range from one to five inches in soil depth and are planted with a variety of low growing succulents or herbaceous plants. This is the most common type of green roof. **Intensive green roofs** are designed with thicker layers of soil that can support a diverse plant community of trees and shrubs. Intensive green roofs can carry more weight and are more complex to create. Not only do green roofs absorb runoff, but the vegetation also helps reduce temperatures, helping to cool the building.



Green roof plants



Green roof on slanted roof

Permeable Pavement and Reinforced Turf

Permeable pavements are made from pervious concrete, porous asphalt or permeable interlocking pavers. **Reinforced turf** consists of interlocking structural units with areas for placing gravel or growing grass. They are best suited for low traffic loads. Whether made from porous asphalt, pervious concrete, interlocking pavers or structural units, permeable pavements and reinforced turf can be a cost-effective alternative for parking lot, sidewalk, and roadway surfaces that treat stormwater at the source.



Permeable pavement



Reinforced turf

Design Variants

- Extensive green roofs
- Intensive green roofs
- Permeable pavements
- Reinforced turf

Pollutant Removal Efficiencies

- Sediments 80%
- Phosphorus 66%
- Nitrogen 56% (as part of a system of environmental site design practices)

More Information

For information on specific design criteria, go to Maryland's Stormwater Design Manual:
mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/stormwater_design.aspx