

Green Roofs, Green Walls, & BioSwales

HOUSTON PERMITTING CENTER BIOSWALE

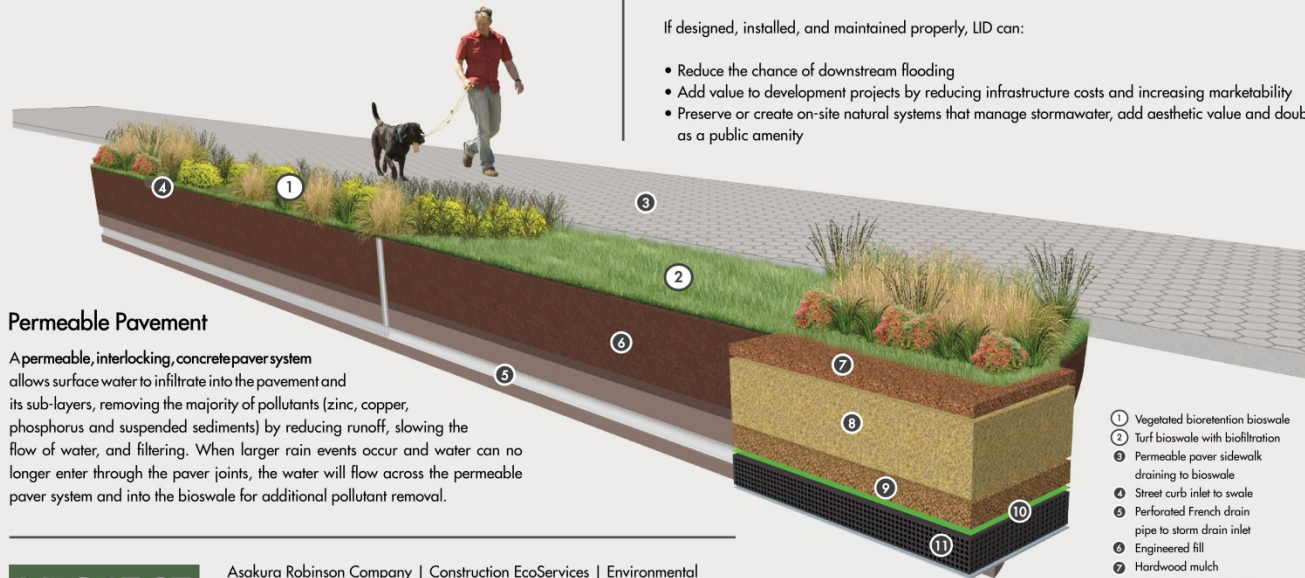
Low-Impact Development through Bioretention, Biofiltration and Permeable Pavement

An earthen alternative to a traditional storm sewer, this bioswale was coordinated by the City of Houston Green Building Resource Center in collaboration with non-governmental organizations and private corporations.

Conventional methods of stormwater management, such as detention ponds and pipe-and-pavement systems, do not prevent or remove pollutants from stormwater runoff. Low-impact development (LID) uses a system of decentralized stormwater techniques distributed throughout a site to capture and filter stormwater runoff at the source, reducing the total volume and amount of pollutants entering waterways.

If designed, installed, and maintained properly, LID can:

- Reduce the chance of downstream flooding
- Add value to development projects by reducing infrastructure costs and increasing marketability
- Preserve or create on-site natural systems that manage stormwater, add aesthetic value and double as a public amenity



Permeable Pavement

A permeable, interlocking, concrete paver system allows surface water to infiltrate into the pavement and its sub-layers, removing the majority of pollutants (zinc, copper, phosphorus and suspended sediments) by reducing runoff, slowing the flow of water, and filtering. When larger rain events occur and water can no longer enter through the paver joints, the water will flow across the permeable paver system and into the bioswale for additional pollutant removal.

PROJECT
PARTNERS

Asakura Robinson Company | Construction EcoServices | Environmental Resources Management Foundation | Houston Land & Water Sustainability Forum | Keep Houston Beautiful | Kuo & Associates, Inc. | Pavestone | Susan Vaughn Foundation | Walter P. Moore | West U Rotary Club | City of Houston Green Building Resource Center | City of Houston Mayor's Office

Bioretention vs. Biofiltration

Often planted with native plants, traditional bioretention systems are multi-functional landscape elements which serve both aesthetic and stormwater management purposes. With an infiltration rate of 1-2 inches of water per hour, these systems require more area and are more maintenance sensitive than their counterparts, but they also showcase artistic landscape design.

High-performance biofiltration systems can treat the same volume of stormwater using a fraction of the area. With an infiltration rate of 100 inches per hour, their reduced footprint makes them ideal for a broad range of urban, suburban and retrofit projects where size, cost, and maintenance considerations drive design decisions.

Cost Comparison

Not including plants, construction costs for a bioretention system with 480 sq. ft. of biofilter is \$14,400, compared to \$3,000 for a biofiltration system with 20 sq. ft. of biofilter. Annual maintenance costs for these systems are \$1,200 and \$250, respectively.

Drainage Area, Volume and Water Quality Treatment

Each system is sized to capture and manage water from approximately one acre, treating the first half inch of runoff from that drainage area. Nearly 7,248 gallons of runoff are stored in each system and treated during a 24-hour period.











Steve Stelzer installing a green wall at English/Stelzer residence







Kathleen English installing a green wall at English/Stelzer residence

















Rain Garden installation at English/Stelzer residence

















