


GREEN INFRASTRUCTURE

Managing Stormwater at
the University of Iowa

GREEN VS. GRAY

Green Infrastructure (GI) is a more natural approach to stormwater management which includes a wide variety of best management practices (BMPs) designed to capture, infiltrate, cleanse, and detain rainfall as close to where it lands on the landscape. There are many benefits to using green infrastructure in combination with traditional gray infrastructure. The university of Iowa embraces sustainability through the installation of GI throughout the campus. During the planning stages of each project on campus, the possible application of GI is evaluated for each site.

Traditional “**gray**” stormwater management systems aim to drain the landscape as quickly as possible. Runoff flows into the street, along the curb, and into a gutter, where a system of underground pipes whisks it away to the nearest waterbody - regardless if it’s a sprinkle or a major storm event. Until recently, this was the only approach to stormwater management, which strictly relied on “gray” infrastructure to protect communities from flooding. This approach does not address all stormwater concerns, and with innovations in technology, other “green” methods have been developed to address these water quantity and quality issues.



GI practices, such as bioretention cells, shown above, are engineered to capture, infiltrate and filter stormwater before it discharges to gray infrastructure. Other GI practices include soil quality restoration, native landscaping, rain gardens, permeable pavers, green roofs, extended retention basins, and wetlands.

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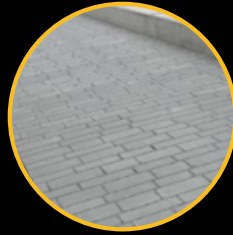
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Showcase of GI on Iowa's Campus

Permeable Pavers

Permeable Pavers are used in place of traditional concrete or asphalt to decrease stormwater runoff. Unlike traditional surfaces, permeable pavers allow stormwater to seep through the joints in the pavers and enter the spaces in the gravel layers below. Water then drains to a subsurface pipe that is connected to the storm sewer system.



Bioretention Cells and Bioswales

Bioretention Cells and **Bioswales** are vegetated, depressional landscaping features that are designed to filter pollutants through an engineered soil mix. They treat small storm flows, while large storms overflow to the storm sewer system. Bioswales are designed to convey larger storm events as well.



Green Roofs

While the design of **Green Roofs** varies, all green roofs consist of a soil medium underlain by several liners, which provides an environment suitable for plant growth without damaging the underlying roof. This GI practice minimizes rooftop runoff.



Native Landscaping

Native Landscaping is the strategic placement of native plants in the landscape to enhance infiltration of stormwater. Their extensive root systems hold soil, slow runoff, and improve infiltration. The plants also absorb nutrients and don't require fertilizers, pesticides, or supplemental water to survive after establishment.



Rain Gardens

Rain Gardens are shallow depressions planted with grasses and perennial, which capture and filter runoff from impervious surfaces. The runoff is temporarily ponded before percolating into the natural soils.



Stormwater Treatment Train

Site conditions and treatment goals dictate which green infrastructure practices are implemented in series since each method targets different rainfall events. Implementing a stormwater treatment train has the potential to greatly reduce the quantity of discharge and pollutants leaving a site.

The university of Iowa uses a combination of practices on campus as part of a much larger treatment train to capture, treat, and retain stormwater. Outside of the university some communities in Iowa use treatment trains that might include biocells in a subdivision that drain to a bioswale system, which subsequently discharges to a retention pond or wetland. In an ultra urban area, where space is limited, a treatment train could consist of a green roof, permeable pavers, and plant filter boxes that eventually discharge to an underground detention system that manages larger rainfall events.

Long-term inspection and maintenance is critical to ensure performance and aesthetics of GI practices. University ground crews regularly inspect and maintain all practices to ensure that they look good and are functioning properly.



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Brochure modified for University of Iowa, a member of ISWEP.