

Stormwater Management

Stormwater is rainwater and melted snow that runs off streets, lawns, farms, and construction and industrial sites. Under natural conditions, stormwater is absorbed into the ground, where it is filtered and ultimately replenishes aquifers, or slowly flows through forests and meadows into streams and rivers. In developed areas, pavement and building roofs prevent precipitation from naturally entering the soil. Therefore, the quantity and quality of that stormwater can affect the environment.

Storm drains and sewers capture rain that falls on impervious surfaces and can accelerate its flow. Runoff can accumulate fertilizers, dirt, pesticides, oil, grease, and many other pollutants before reaching natural bodies of water. Once stormwater enters streams or rivers, it can cause bank erosion and flooding. Stormwater runoff is the most common cause of water pollution

The goal for stormwater management is to limit disruption of natural water bodies by reducing impermeable surfaces, increasing on-site infiltration, reducing or eliminating pollution from stormwater runoff, and eliminating contaminants. To help promote stormwater management, the site can be designed to maintain natural stormwater flows.

Low Impact Development (LID) strategies have the potential to address many of the issues affecting the health of waterways and stormwater management. LID strategies can improve runoff quality, reduce the risk and impact of flooding and deliver an additional water resource to increase potable supply. The following looks at different LID strategies that are successful when managing stormwater.

Stormwater LID Strategies:

Bioretention Cells: Bioretention cells, also referred to as rain gardens, are small, landscaped, graded areas that are constructed with a special soil mix that can absorb and filter runoff. Low maintenance, water-tolerant plants are often used in these bioretention cells. These landscaping elements aid in reducing stormwater runoff, replenishing the aquifer, and filtering non-point source pollution.

Cisterns: Cisterns are storage tanks that can be designed to capture stormwater runoff. Stormwater diverted and collected in cisterns can be used to supplement or replace existing potable water uses, such as irrigation.

High Density Plastic Grid: This is a flat grid made of high density plastic that is a means to reduce soil compaction and maintain infiltration in areas subject to vehicle traffic.

High Efficiency Irrigation: Irrigation techniques, timers, and moisture sensors can be utilized to reduce excess watering and promote water conservation. If the stormwater runoff is collected in cisterns, it can be used in place of potable water for these irrigation systems.

Permeable Concrete: This is a specially mixed concrete product with most of the fine aggregates removed from the concrete mixture. The removal of the fine aggregates creates pores

that allow water to travel through the concrete to a stone reservoir underneath the pavement. This allows stormwater to be filtered, detained, or infiltrated into the ground.

Permeable Pavers: Permeable pavers are used to intercept and transmit runoff to permeable soils or gravel layers where pollutants are filtered, runoff is slowed, and aquifers are replenished. A gravel storage reservoir used in conjunction with pavers can hold large amounts of water to help control the timing and volume of runoff. The pavers, made of concrete, brick, or recyclable plastic materials, can be incorporated into grass and open areas or installed as roadways or parking surfaces.

Runnels: Runnels are small surface depressions in sidewalk areas that safely channel small amounts of stormwater runoff. Stormwater can be channeled to a cistern for reuse in the irrigation system.

Sustainable Landscaping: Sustainable plant species thrive with minimal maintenance. Most are native plants, which are well adapted to local conditions and can reduce stormwater runoff.

<http://www.epa.gov/oaintrnt/stormwater/index.htm>

The United States has enacted federal requirements to help regulate stormwater and comply with the Clean Water Act. State and local governments have enacted their own stormwater management laws and ordinances and some have even expanded their coverage beyond federal requirements. For information on State Stormwater Best Management Practices, please visit the following website:

<http://yosemite.epa.gov/R10/WATER.NSF/0/17090627a929f2a488256bdc007d8dee?OpenDocument>

In an effort to reduce stormwater runoff, sports facilities have implemented various methods for treatment and control.

The New York Mets plan to use approximately 65,000 square feet of porous pavers and a 3,500 square foot drainage bed to control stormwater runoff for parking areas. This will allow rain water to infiltrate through the surface and recharge the groundwater instead of running off the surface. There are also plans to have large areas on the grounds left unpaved and landscaped to further control stormwater.

The Washington Nationals use a unique, intricate water filtration system to separate water used for cleaning the ballpark from rainwater falling on the ballpark. It treats both sources before it is released to the sanitary and stormwater systems. Because the site is within close proximity to the Anacostia River, much care is taken to treat storm and ground water runoff. Special care is also given to screening organic debris, such as peanut shells, from the stormwater system.

<http://yosemite.epa.gov/opa/admpress.nsf/d10ed0d99d826b068525735900400c2a/d87469e9e29de0238525740b004fc02c!OpenDocument>

http://mlb.mlb.com/was/ballpark/green_ballpark.jsp