FALL CREEK BIORETENTION PROJECT

The City of Indianapolis constructed a green infrastructure pilot project to improve water quality in Fall Creek. The project, the first of its kind for the city, used native plants, soil, stone and other natural elements to filter pollutants from storm water before releasing it into Fall Creek. The project also served as a model for future green infrastructure projects in Indianapolis.

For this project, the Indianapolis Department of Public Works (DPW) partially separated combined sewers and redirected storm water to a bioretention cell for treatment.

THE PROBLEM

Indianapolis’ combined sewer system in the old city limits is more than 100 years old and was designed to carry both sewage and storm water in the same pipe. As little as a quarter-inch of rain can overload the combined sewers, causing raw sewage to overflow into nearby streams, including Fall Creek.

In addition, storm water picks up and carries pollutants as it runs off of rooftops, parking lots, streets, lawns and other surfaces. These pollutants can end up flowing directly into our waterways.

THE SOLUTION

To help reduce raw sewage overflows and improve the water quality of Fall Creek, DPW partially separated combined sewers near the College Avenue and Fall Creek Parkway area and nine existing storm drains were redirected to a new storm sewer pipe. The storm drains and storm sewer pipe collect storm water runoff and carry it to a bioretention cell, where it will be treated through a natural system of plants, soil and stone before being released into Fall Creek.

Bioretention cells are designed and constructed to treat what is commonly known as the “first flush,” which is typically up to one inch of rainfall.

The new storm sewer connects to a series of pipes within a stone filter at the base of the 70-foot by 35-foot bioretention cell. The stone filter temporarily holds storm water until it rises to the top of the filter. Once it reaches the top, storm water flows over onto the surface to be absorbed into the cell.

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The storm water filters through more than 1,300 native, deep-rooted plants, trees and shrubs, including Red Maple, River Birch and Witch Hazel. These plants remove trash, debris and other pollutants. As the storm water filters through the soil, a layer of porous stone below captures additional pollutants. A perforated drain pipe below the stone collects the treated storm water and releases it into Fall Creek through an outlet pipe as an overflow system during heavy rain events.

As part of this project, DPW installed two monitoring structures. These structures are used to collect water quality samples before and after treatment in the bioretention cell to measure water quality improvements. DPW will use this data to help guide similar green infrastructure projects in the future.

The cell is located on existing public ground owned by Indy Parks and Recreation.

In addition to improving the water quality of storm water entering Fall Creek, the project also reduced costs of the City’s Long Term Control Plan by reducing the amount of clean water, such as rain or melting snow, that is unnecessarily transported and treated at the treatment plants.