

The Bronx Zoo Bio-filtration Swale and Restored Wetland

*Bronx Zoo
Bronx, NY*

Princeton Hydro was contracted by the Bronx Zoo to design a stormwater system to capture and passively treat runoff from an unpaved parking lot. The parking lot contributed runoff to the adjacent Bronx River - runoff that was heavily laden by suspended particulates, excess nutrients, and that also frequently included trash and debris.

Princeton Hydro designed a meandering bio-filtration swale to capture the runoff from the parking area. Native plantings introduced within the swale and along its banks serve to improve water quality by slowing flows and thereby enabling suspended matter filtration as well as uptake of macronutrients. The design also incorporated natural stone “check dams” that further reduce flow velocity and enable particles to settle in locations readily accessed for routine clean-out.

The bio-filtration swale includes two reaches that terminate at a perforated riser which in turn emptied into a lateral diffusion network. Flow from this diffusion feature is slowed by traveling through a restored wetland that ultimately drains to the Bronx River. Large storm flows by-pass the diffusion feature by entering a landscaped “scour hole” that is integrated into the restored wetland. In combination, the bio-filtration system efficiently manages and abates pollutants associated with the majority of rain events while also protecting the Bronx River from erosive forces that occur during intense or extreme storms.

The project included several informative kiosks that detail native plants, wildlife, and habitat associated with the bio-filtration swale and wetlands. The bio-filtration swale and restored wetland are focal points of the Bronx Zoo’s River Walk exhibit.

