

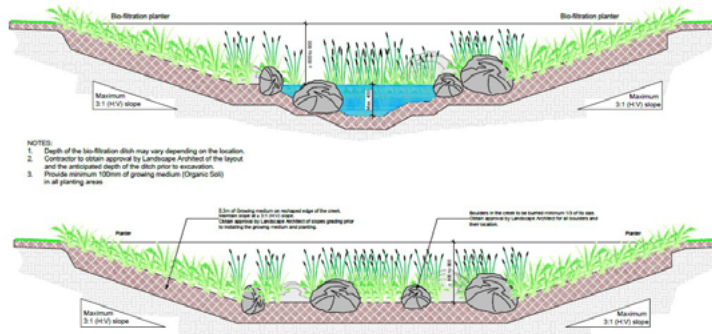


constructed wetlands, south africa

The ever-increasing area of paved surfacing in the rapidly expanding urban communities results in a growing number of engineered stormwater structures, which are designed to manage the runoff flowing from the roads and hard landscape areas. Water mixed with various pollutants from the impervious surfaces is removed by an underground storm system and does not infiltrate the subgrades. This results in three major problems:

- surges of runoff that increase erosion of the land
- growing pollution of rivers and lakes that collect the runoff
- reduction of natural infiltration into the subgrades that maintains levels of groundwater table.

Badly designed stormwater management is one of the key issues that negatively impacts natural environment and results in its ecological degradation.



Detail 1 - Sections through Bio-Filtration area



A **natural wetland** is a distinct ecosystem that is flooded by water, either permanently or seasonally, and provides a valuable habitat for wildlife. Therefore, these wetlands are protected by various legislations and cannot be used for bio-filtering polluted runoffs. However, **constructed wetlands** are artificially created and are primarily designed to treat sewage, greywater, stormwater or industrial wastewater.

LASquare has been involved in a number of projects where the creation of constructed wetlands was the main objective of the landscape design. These activities include:

- designing for bio-filtration systems that clean the water before it is collected in the storm sewers
- daylighting of selected sections of existing underground storm lines or open, concrete-paved channels and converting them into constructed wetlands
- designing of detention ponds that slow down the peak flows after large rain events
- designing of trash catchment systems that capture litter flowing the in the stormwater
- reclamation of rivers and lakes that have been contaminated by urban or industrial runoff



In urban developments, there is a large number of small rivers and their seemingly insignificant tributaries that are hidden underground and flow through the engineered storm systems. Eventually, the runoff is brought to the surface from the buried pipes, where it naturally meanders through the open land. The impact of the accumulated waste is the most visible at these locations.

Natural and constructed wetlands absorb a large volume of pollutants dissolved in water, slow down the flows that result in the reduced peak of runoff and allow for water to infiltrate into the subgrades.

