



THE UNIVERSITY OF ADELAIDE  
Department of Civil and Environmental Engineering

# Grass Filtration – An Innovative Approach to the Treatment of Urban Storm Water

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## Statement of Originality

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## ABSTRACT

Increased urbanisation has led to a significant deterioration in the quality of stormwater runoff with some pollutant levels in the order of 10 times higher than the recommended acceptable levels for the protection of freshwater ecosystems. A number of approaches are taken to improve the quality of urban stormwater.

This thesis reports on a novel application of grass vegetated filter strips which has been developed to direct urban stormwater in two very different environments. The first was a new subdivision in the first stages of development. The site is in a hilly terrain with the filter strip being established on a gradient of approximately 19% and with a ratio of catchment to filter area of 250. This site highlighted some of the problems which can occur in areas or circumstances of high sediment generation. Recommendations are provided for appropriate design and construction approaches which could minimise problems on such sites.

The second site was retro-fitted into the stormwater system of a mature developed housing catchment of 26 ha with a filter strip being established in existing parklands on relatively flat terrain and with a filter of kikuyu grass at a gradient of approximately 3% and a ratio of catchment to filter area of approximately 350.

Monitoring of the second system has demonstrated that, although total suspended solids (TSS) concentrations averaged 31mg/L which were extremely low, average removal rates of 44% were achievable. This shows some variation from a theoretical analysis of the monitored storm events using two simple graphical approaches (Maryland Dept of Natural Resources Standard of Infiltration Practices (1984) and USA Dept of Transportation, Federal Highway Administration (1996)) and a computer simulation using VFSMOD (Munoz-Carpena, and R., Parsons, J.E. (2001)).

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