Way Beyond Best Practice: Grassed based ZAM-WSUD profiles demonstrate up to 80% Total Nitrogen Removal

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Biography:
Simon is an environmental engineer and technology manager with a passion for exploring the potential for innovation and new technologies to improve global futures. He initiated the Zero Additional Maintenance Water Sensitive Urban Design project (ZAM-WSUD), and has actively overseen coordination of a range of project partners, stakeholders and contractors through the development and implementation phases. Simon also recognises the importance of addressing big picture global environmental issues such as climate change and is actively involved with the development of low carbon emerging energy technologies and the progression of post standard model physics.

Harsha is a Research Fellow in the Department of Civil Engineering, Monash University. She holds a Bachelor in Civil Engineering and a PhD in Water Engineering from Monash University. Her research interests relate to the development and application of green infrastructure for urban water management. She is passionate about promoting sustainable development strategies for integrated water management.

Laboratory trials have demonstrated that a range of grass species, planted in well-designed filter media profiles can be highly effective at stormwater nutrient removal, performing way above best practice for total nitrogen removal. Results highlight the potential for a new generation of grassed based water sensitive urban design (WSUD) systems, with significantly improved nutrient removal capabilities.
A one-year long laboratory column trial, conducted at Monash University, assessed the nutrient removal and infiltration capacity of six different lawn grasses (Kenda Kikuyu, Village Green Kikuyu, Santa Ana Couch, Empire Zoysia, Nara Native Zoysia and Palmetto Soft Leaf Buffalo). Grassed were planted in multi-layered, sand based filter media profiles. After establishment, all species performed very well under both wet and dry weather conditions removing 70% to 80% of total nitrogen.
Trials were part of the Zero Additional Maintenance Water Sensitive Urban Design (ZAM-WSUD) project. ZAM-WSUD is a water sensitive urban design system that has been designed so that the ongoing maintenance implications for the asset owner are negligible. Planting with lawn grasses is one WSUD modification used in ZAM-WSUD systems to lower maintenance requirements.
In field grassed ZAM-WSUD systems have shown great potential for lowering the maintenance requirements for WSUD systems. A trial of five different lawn grass species, tested for their survival and growth in the field, found that different site conditions require different lawn grass species to best suit the environment. The field trial only assessed grass survivability, hence the nutrient removal abilities of various lawn grasses remained unknown. These laboratory trials provide confirmation that grassed ZAM-WSUD systems can meet regulatory requirements and best practice standards, if conditions are favourable for plant health and growth.

The ZAM-WSUD project also explored practical aspects of retrofitting grassed WSUD systems into existing suburban streetscapes. New initiatives trialled included: a modified filter media profile, litter barrier inlets and sediment grooves.

This presentation will discuss the results of the laboratory column trial and practical considerations for the implementation of next generation grassed WSUD and ZAM-WSUD systems.