

## The Use of Sustainability Criteria on Infrastructure Design to Encourage Sustainable Engineering Solutions on Infrastructure Projects

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**Abstract :** In order to stay competitive and to meet upcoming stricter environmental regulations and customer requirements, designers have a key role in designing civil infrastructure so that it is environmentally sustainable. There is an urgent need for engineers to apply technologies and methods that deliver better and more sustainable performance of civil infrastructure as well as a need to establish a standard of measurement for greener infrastructure, rather than merely use tradition solutions. However, there are no systems in place at the design stage that assesses the environmental impact of design decisions on township infrastructure projects. This paper identifies alternative eco-efficient civil infrastructure design solutions and developed sustainability criteria and a toolkit to analyse the eco efficiency of infrastructure projects. The proposed toolkit is aimed at promoting high-performance, eco-efficient, economical and environmentally friendly design decisions on stormwater, roads, water and sanitation related to township infrastructure projects. These green solutions would bring a whole new class of eco-friendly solutions to current infrastructure problems, while at the same time adding a fresh perspective to the traditional infrastructure design process. A variety of projects were evaluated using the green infrastructure toolkit and their results are compared to each other, to assess the results of using greener infrastructure verses the traditional method of designing infrastructure. The application of 'green technology' would ensure a sustainable design of township infrastructure services assisting the design to consider alternative resources, the environmental impacts of design decisions, ecological sensitivity issues, innovation, maintenance and materials, at the design stage of a project.

**Keywords :** eco-efficiency, green infrastructure, infrastructure design, sustainable development

**Conference Title :** ICCSSE 2017 : International Conference on Civil Systems, Sustainability and Environment

**Conference Location :** New York, United States

**Conference Dates :** August 07-08, 2017