

# Hydraulic and hydrologic performance evaluation of low impact development technology

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## Abstract

Low impact development (LID) is a widely used technology that aims to reduce the peak flow volume and amount of pollutants in stormwater runoff while introducing physicochemical, biological or a combination of both mechanisms in order to improve water quality. This research aimed to determine the effect of hydrologic factors in removing the pollutants on stormwater runoff by an LID facility. Monitored storm events from 2010-2018 were analysed to evaluate the hydraulic and hydrological performance of a small constructed wetland (SCW). Standard methods for the examination water and wastewater were employed to assess the water quality of the collected samples (APHA et al, 1992). Primary hydrologic data were obtained from the Korea Meteorological Administration. The recorded average rainfall intensity and antecedent dry days (ADD) of SCW were 5.26 mm/hr and 7 days respectively. During the highest rainfall event (27 mm/hr), the removal efficiency of SCW for all the pollutants was ranging from 67% to 91%. While on the lowest rainfall event (0.7 mm/hr), the removal efficiency was ranging from -36% to 62%. Rainfall intensity has a significant effect to the removal efficiencies of each facility due to its dilution factor. In addition to that, there was no significant correlation of ADD to the mean concentrations of pollutants. Generally, stormwater runoff contains significant amount of pollutants that can cause harmful effects to the environment if not treated. Also, the component of this LID facility such as pre-treatment zone, media filters and vegetation contributed to the effectivity of the LID facilities in reducing the amounts of pollutants present in stormwater runoff.

*Keywords:* heavy metals, low impact development, nutrients, stormwater

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