

A Case Study of Extensive Green Roof System for Tropical Climate in Malaysia

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Abstract

Rapid urbanization has taken environmental toll on the surrounding which can be witnessed by the advent of global warming and climate change. Driven by environmental needs, Green Building Index (GBI) was established in Malaysia to drive initiative to lead the property industry towards becoming more environmental friendly. Green roofs (roof with vegetated cover) as one of the assessment criteria of GBI, are gaining attention in the Malaysian society as a versatile new environmental friendly mitigation technology. This paper evaluates the qualitative and quantitative performances of an extensive green roof at Humid Tropics Centre under local tropical climate. Simulations showed that the extensive green roof system could reduce the peak discharge up to 26% in relation to impervious brown roof. Its reduction ability decreased for storms with intense rainfall. Increment of pH was observed for the green roof runoff and the runoff water quality ranged between class I and II under Water Quality Index (WQI). High concentrations of phosphate were noticed in the runoff samples and substrates (fertilized planting soil) might be the potential contributor. Findings indicate that there was a reduction of around 1.5°C for indoor temperature of the building after installation of the extensive green roof.

Keywords : Extensive green roof, Green Building Index, Runoff reduction, Runoff quality

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