

Thermal Behavior of Green Roof: Case Study at Seoul National University Retentive Green Roof

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Abstract : There has been major concern about urban heating as urban clusters emerge and population migration from rural to urban areas continues. Green roof has been one of the main practice for urban heat island mitigation for the past decades, thus, this study was conducted to predict the cooling potential of retentive green roof in mitigating urban heat island. Retentive green roof was developed by Han in 2010. It has 320 mm height of retention wall surrounding the vegetation and 65mm depth of retention board underneath the soil, while most conventional green roof doesn't have any retention wall and only maximum of 25 mm depth of drainage board. Seoul National University retentive green roof significantly reduced sensible heat movement towards the air by 0.5 kWh/m², and highly enhanced the evaporation process as much as 0.5 - 5.4 kg/m² which equals to 0.3 - 3.6 kWh/m² of latent heat flux. These results indicate that with design enhancement, serving as a viable alternate for conventional green roof, retentive green roof contributes to overcome the limitation of conventional green roof which is the main solution for mitigating urban heat island.

Keywords : green roof, low impact development, retention board, thermal behavior, urban heat island

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