

Thermal Behavior of the Extensive Green Roofs in Riyadh City

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Abstract : Green roof is one of sustainable practice for reducing the environmental impact of a building. Green roofs are vegetation roofs that are partially or completely covered building's roof. It can provide multiple environmental benefits such as mitigation of urban heat island effect and protecting buildings against solar radiation. In Riyadh city buildings consume about 70 % of the total energy used in the building for cooling and heating because of the Riyadh's harsh and tropical climate. So, the study aim was identifying the thermal performance of extensive green roof and comparing its performance with concrete roof performance during summer season. The experimental validations results indicated that the extensive green roofs system was better than concrete roof system for lowering the indoor air temperature. It could reduce the indoor air temperature from 2°C to 5.5°C compared to the concrete roof system. Also, the finding of this study demonstrated that extensive green roof system could reduce 12% to 33% of energy consumption of air conditioning in Riyadh city during summer seasons by using environmentally friendly insulation.

Keywords : thermal performance, green roof system, concrete roof system, tropical climatic, internal temperatures

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