

Monitoring Energy Reduction through Applying Green Roofs to Residential Buildings in Dubai

Authors : Hanan M. Taleb

Abstract : Since buildings are a major consumer of energy, their potential impact on the environment is considerable. Therefore, expanding the application of low energy architecture is of the utmost importance. Designing with nature is also one of the most attractive methods of design for many architects and designers because it creates a pathway to sustainability. One feature of designing with nature is the use of green roofing which aims to cover the roof with vegetation either partially or completely. Appreciably, green roofing in a building has many advantages including absorbing rainwater, providing thermal insulation, enhancing the ecology, creating a peaceful retreat for people and animals, improving air quality and helping to offset the air temperature and heat island effect. The aim of this paper is to monitor energy saving in the residential buildings of Dubai after applying green roofing techniques. The paper also attempts to provide a thermal analysis after the application of green roofs. A villa in Dubai was chosen as a case study. With the aid of energy simulation software, namely Design Builder, as well as manual recording and calculations, the energy savings after applying the green roofing were detected. To that extent, the paper draws some recommendations with regard to the types of green roofing that should be used in these particular climatic conditions based on this real experiment that took place over a one year period.

Keywords : residential buildings, Dubai, energy saving, green roofing, CFD, thermal comfort

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