

Topic: An Investigation of Options to Improve Thermal Performance of Roof

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ABSTRACT

Thailand is located in a hot humid tropical zone, where the main position of electricity in residential buildings and commercial buildings is consumed by air conditioning loads. A reduction of the electricity consumption by the air conditioning systems, by means of suitable design on the thermal mass of building envelopes should be of interest. The theoretical study on heat transfer through roof when it is insulated and un-insulated, ventilated and un-ventilated, when the exterior roof surface is coated with low-emissivity material and un-coated, and when the room under roof is used as bedroom and as office are experimental results. The simulation program will be use to verify results of theoretical study for the configurations. All result will be help to investigate options to improve thermal performance of roofs of typical configurations when the spaces belows are used under common functions. This study consists of experiments and calculations conducted at the experimental site in Bangkhunthien Campus of the Joint Graduate School of Energy and Environment, King Mongkut's University of Technology Thonburi. The simulation program used to determine the annual results was BESim.

Keywords: Heat transfer, Roof, Thermal performance