

Cooling of Buildings by Roof Surface Evaporation in Sri Lanka by Considering the Climate Pattern

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Abstract — Heat on buildings mostly enters through roofs, as these are exposed to sun throughout the day. Many attempts have been made to reduce the ingress of heat by various methods like, by increasing thickness of roofs and providing insulation by covering by reflectors, additional clay tile cover or lime-concrete cover or even reflector painting. Methods like continuous water spraying, intermittent spraying or ponding of water on roofs is either less effective or difficult to adopt. Similarly artificial or mechanical gadgets such as airconditioners or desert coolers have high energy requirement. This paper is based on a continued research in finding economical, effective and natural way of cooling of dwelling units as well as multi storied buildings. Traditional methods like Khas Khas mats, water fountains, etc. were also analyzed along with the evaporative cooling. The feeling of comfort after taking bath as a result of utilization of body heat for the evaporation of water was also looked into. This lead to the efforts of creating comfortable living and working conditions in buildings by evaporation of water. A process was accordingly developed by this research utilizing the concept of cooling of buildings by roof surface evaporation. Finally this paper recommends some guidelines for Roof Surface Evaporation Cooling System for Sri Lankan climate condition.