NATURAL VENTILATION AND TROPICAL ARCHITECTURE:
Towards a Sustainable Future in Tropical Architecture Using the Passive-
Energy Design Strategies of Natural Ventilation.

by

PU SUAN HAU
HD991246A

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ABSTRACT
The principle emphasis of this dissertation is to raise the awareness of ecological design
strategies by encouraging a more holistic approach towards architectural design in our built
environment, focusing on one major aspect of ‘passive energy’ design – natural ventilation.
This paper focuses on the feasibility of the application of natural ventilation design
strategies to achieve satisfactory thermal comfort level in our climate. It is important to
note how these strategies can be drawn from the vernacular and transformed into an
identifiable language in modern sustainable tropical Asian architecture.

To design for natural ventilation, one must first understand the basic concepts of thermal
comfort in relation to our tropical climate. One main question put forth is that can a
building be totally naturally ventilated in such a climate and to what level of success? If
not, what are the alternatives that can be proposed? This paper will examine architectural
strategies design for natural ventilation based on factors of differing scales ranging from
landform and building orientation to building details such as envelope and openings.

A portion of study will be dedicated to the study of age-old vernacular design principles in
order to understand the successes of their building typologies in a particular locality. A
case study of the traditional Malay house will be is used to illustrate the adaptation of
vernacular design principles to our tropical climate. Another case study involving
contemporary architecture will be used to exemplify a new language in tropical Asian
buildings using unprecedented design means.