

Thesis Title	A Study on Planning Model of Single House for Conservation of Energy. Case Study : In Bangkok
Student	Mr. Vichaed Suvisit.
Student ID.	38062100
Degree	Master of Architecture Program in Tropical Architecture
Programme	Architecture Faculty of Architecture
Year	1999.
Thesis Advisor	Assist. Prof. Preechaya Rungsiraksa.

ABSTRACT

Some of the dwellings that are seen presently are imitated from foreign countries without a through understanding of its architectural and utilizable concepts. Hence, the direct impact on the living in such dwellings is that the physical conditions in the house does not perfectly suits to their desired living. Meanwhile, the external conditions of the house has gradually changed inferiorly in every aspects. To have more comfortable living from such dwellings, human beings has to consume extra energy in order to create favorable atmosphere according to their needs. One such concept to solve the problem of how to make the house in the current environment comfortable is to use the mechanism so called " Air-Conditioner " in the house. However, using this solution without a careful study of course effect on the problem can make the country loose tremendous amount of energy and natural resources.

Studying single house, a research emphasizing the middle size of single house (composed of 5-6 persons), 2 storey, 3 bedroom, with constructed land area of 70 square-wah and located in Bangkok. The components suitable for the size of each area are carefully selected considering activities, size of furniture, number of people & human behaviour.

The weather conditions in Bangkok is an important factor in designing a house. The weather is influenced by many factors such as nature, climate, radiation of sun, temperature, humidity, rain, wind etc. The comparison with Equatorial Comfort Index (ECI) Webb, C.G. 1960 is used to know the months that has the temperature over the convenient temperature range. The time range for different months is as follows. The period of April - June, 9.00 AM - 8.00 PM, July - September, 9.00 AM - 7.00 PM ,

October – January, 10.30 AM, February – March, 10.00 AM – 6.00 PM, The average temperature exceeds 27.7 °C (ECI), the comfortable temperature is about 25.6 °C (ECI).

A sample single house type A & type B is considered for studying the single house in Bangkok in order to assess RTTV & OTTV.

A research on various factors and their influence on human energy consumption in a house is done to study the theory and concept of design and to solve the problem of using energy. Today the impact of gradually changing environment has made it difficult to live, forcing to use some mechanism to improve the well being of internal conditions of house which probably would be an another way to choose from. However, a carefully study must be conducted on house to minimize the necessity of using such mechanism as much as possible.

In this research, an experiment on single house is presented to create more comfortable living by using suitable technique which emphasizes more on nature in order to suit the standard and theory of Thai living style in tropical countries. The research is studied on the sample single house type A & type B by calculating Overall Thermal Transfer Values (OTTV), Roof Thermal Transfer Value (RTTV) and Cooling Load in order to compare the result and find out the conclusion.

The result of the experiment and study has shown satisfaction that the presented single house is capable of conserving energy particularly the burden of cooling in hot weather. Moreover the design of single house maintains the comfort of living. The experiment also implies that the heat can be dissipated from inside of the house to outside while maintaining the beauty, suitability, taste and living quality of Thai people.

The result of the experiment and study has shown that the OTTV of type B house compared with type A house has reduced to 54.20% and 46.50% respectively (the front of house is in North direction), the RTTV of type B single house compared with type A house has reduced to 79.80%. Cooling Load of type B house compared with type A house and presented house has reduced to 59.55%, 69.60% and 39.30% respectively.

It can be concluded from the analysis of the research that the energy consumption of single house type B has a potential to save and consume less energy from single house type A, type D and presented house as 59.55%, 69.60% and 39.50% respectively (Energy consumption of Air-Conditioner system considered).