

Sukanyar Nilphai 2014: Honeycomb Flexible Sunlight Façade.

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Mr. Parames Kamhangrittirong, D.Eng. 128 pages.

This study aims to develop a prototype of an adjustable building envelope for sunlight protection. The development of the façade was inspired from honeycomb structure due to it is efficient in term of direct sun radiation protection. Appropriate model analysis and efficacy testing of the façade to light filtering and reduce heat indoors temperature were assessed using experimental test boxes. All sides of each test box were cement board with insulation thickness of 1 inch. The front (south side) side of each box was a single-pane transparency glass, 6 mm. of thickness. The box sizing was 1.00x1.00x1.00 m.(WxLxH) Box A was without the façade. Box B and box C were equipped with the façade (opening 65% and 30%). Illuminance and temperature during 23-26 March 2014 to from 6:00 am. to 6:00 pm. were recorded every 5 minutes and 10 minutes respectively. The result showed that (1) the maximum external luminance up to 88,759 lux was reduced to 59,804, 18,355 and 14,757 lux respectively, within the box A, B, C at position 1. (2) For the outside temperature was highest (40.11°C), the average highest indoor temperature within the A, B, C were 56.66, 47.91, 46.61°C, respectively. The indoor Illuminances and the indoor temperature variable to the opening of the façade. The results of the test confirmed that the proposed facade has the ability to filter light and reduce indoor the temperature of the experimental boxes. Therefore the proposed façade offers a new alternative for modern sustainable design and promote innovation.

Key words : 1 Façade, 2 Sustainable modern architecture, 3 Flexible shade,

4 Biomimicry

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