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Classification of Natural Ventilation Strategies in Optimizing Energy Consumption in Malaysian Office Buildings

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Abstract

Buildings have been defined as one of the major contributors to environmental problems in construction and operation stages. Intensive researches have been conducted to intensify green building designs by using alternative sustainable construction technologies and operation approaches in order to reduce energy use, and at the same time, to maximize the utility of natural resources. One of the strategies that are widely applied in the building operation recently is to optimize the potential usage of natural ventilation within an interior building space. This paper explores literally the conceptual approaches of classifying physical passive designs to optimize the application of natural ventilation within building zones. Through these findings, the categories of physical designs can be classified in five major groups, which are Air Wells, Façade Designs, Ventilation Openings, Corridors and Shadings, and Blockage and Partitions.

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Keywords: Natural ventilation; Physical Passive Designs; Multiple Regression Analysis

1. Introduction

The construction sector intensifies the utility of resources, especially the energy consumption during the occupation stages. It is found that buildings consume about 40% of total world energy [1]. Among the distribution of energy usage in a building, ventilation and air-conditioning contribute to the highest percentage, especially in office buildings [2],[3].

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