THE OPTIMALIZATION OF DAYLIGHT QUANTITY BY BUILDING CONFIGURATION SETTING IN DENSE SETTLEMENTS IN SURABAYA

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ABSTRACT

Layout patterns in high density residential buildings are adjacent to each other. It cause the quantity of daylight is reduced. Compact building has limited number of openings on its envelope that can receive daylighting. The aim of this study are evaluating the configuration pattern of existing buildings, explaining the relationship and influence between building configuration with daylighting and searching for the layout pattern and shape of the building which is get optimum of daylighting and achieve good quality, to support activities inside the building.

Experimental research methods with simulation techniques was conducted to determine the extent variables which affect on daylighting performance on simple residential building. Lighting simulation technique is using by software Ecotect v5.2. Performance indicators of the experiment is Daylight Factor and uniformity ratio.

Results of this study showed a trend of increasing the DF value in pattern layout with farther distance and a trend of decreasing the DF value in the shape of room/building with a larger shape index. Layout type B at a distance of 10 m to the other buildings in the front and 1.5 in the rear with a shape S (Shape Index 0,762), is the pattern of building configuration to obtain optimal daylighting. Optimal lighting performance occurs in Model 3 type layout B with DF of living room: 2,61%, uniformity ratio: 2,2; DF of bedroom 1: 1,06%, uniformity ratio: 1.63; DF of bedrooms 2: 0.86%, uniformity ratio: 2,1.

Keywords: building configuration, dense settlements, housing, quantity of daylight