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Impact of Urban Orientation on Environmental Comfort factors for Residential Buildings - A Comparative Analysis

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Abstract:

Providing a comfortable climatic environment in the residential shelter is one of the renewed challenges in the field of architecture, especially in the desert environment. Therefore, the study focused on taking advantage of negative design concepts in the field of energy conservation, by modifying the selection of the optimal orientation of buildings in urban fabric and studying the relationship between residential buildings and their mutual effects on shading rates. Thus rationalizing the amount of energy consumed as an alternative to providing a comfortable environment. One of the neighborhoods of New Cairo was chosen as an applied example for the new cities, as it represents an organic extension of the city of Cairo in the desert back of the city. By making a comparison between a proposed model in which the optimal orientation of the buildings and the compact urban fabric was taken into account mainly to clarify the discrepancy in the effect of not taking into account the most appropriate orientation of the buildings with the movement of the sun and wind in the current urban coordination model. Shows the effect of reducing thermal loads on residential buildings and maximizing the use of good ventilation, and the extent to which environmental comfort is achieved within residential buildings with the least amount of energy consumed in the proposed model. The study concludes with recommendations that take into account the local climatic environment in planning urban expansions in the next phase.

Keywords:

Best orientation, Desert town, Rationalize energy, Urban fabric, passive design

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