

The Role of Building Services in Energy Conservation into Residential Buildings

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Abstract : The problem of study focuses on thermal comfort realization in a residential building during hot and dry climate periods consumes a major electrical energy for air conditioning operation. Thermal comfort realization in a residential building during such climate becomes more difficult regarding the phenomena of climate change, and the use of building and construction materials which have the feature of heat conduction as (bricks-reinforced concrete) and the global energy crises. For that, this study aims to how to realize internal thermal comfort through how to make the best use of building services (temporarily used service spaces) for reducing the electrical energy transfer and saving self-shading. In addition, the possibility of reduction traditional energy (fossil fuel) consumed in cooling through the use of building services for reducing the internal thermal comfort and the relationship between them. This study is based on measuring the consumed electrical energy rate in cooling (by using Design-Builder program) for a residential building (the place of study is: Egypt- Suez Canal- Suez City), this design model has lots of alternatives designs for the place of building services (center of building- the eastern front-southeastern front- the southern front- the south-west front, the western front). The building services are placed on the fronts with different rates for determining the best rate on fronts which realizes thermal comfort with the lowest of energy consumption used in cooling. Findings of the study indicate to that the best position for building services is on the west front then the south-west front, and the more the building services increase, the more energy consumption used in cooling of residential building decreases. Recommendations indicate to the need to study the building services positions in the new projects progress to select the best alternatives to realize 'Energy conservation' used in cooling or heating into the buildings in general, residential buildings particularly.

Keywords : residential buildings, energy conservation, thermal comfort, building services, temporary used service spaces, DesignBuilder

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