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**Theoretical Study of Energy Saving Through Redesign of Water Distribution Arrangement in a Medium-Rise Residential Building**

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**Abstract**

The development of medium-rise buildings for the residence is the basic necessity to accommodate the growing population of countries like India where the residential land per capita is very small. Moreover, because of the energy shortage, energy-efficient development is the primary objective in the present scenario. With the efforts of reducing energy consumption in the medium-rise buildings, redesign of the water distribution system has been proposed in this study. In this proposed arrangement, two water pumps are placed at two different elevations, namely, ground and middle levels of the building. The first one at the ground level supplies water first to the middle floor flats and the second one at the intermediate level does for the middle to the top floor flats. Various building heights and pumps are studied theoretically and the analysis of the results shows that about 20% of the total pump energy can be saved by changing the way of water distribution in the residential buildings. Yet further energy-saving potential is available through the selection of better efficiency pumps. Moreover, reduction in pressure of the water at the lower floor flats is an additional advantage of the proposed arrangement.

**Keywords:**

energy saving, medium-rise residential building, water distribution, water pump

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