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Thermal Inertia Analysis of The First Zero Energy Building in Iran

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Abstract

The project of design and construction of the First Zero Energy Building in Iran was assigned to the MABNA group as an EPC contract. Zero Energy Building means building which its annual energy consumption would be Zero. Using the new modern standard design in building architecture such as : passive solar design, building direction, space layout and isolation in design, caused 90% energy saving compared with normal building and only about 87 kWh/m^2 is enough for building, while this energy will be compensated by solar system. The energy use for maintaining comfortable indoor temperature is to a certain extent dependent on the thermal storage capacity of materials in contact with indoor air. In this paper, the numerical simulation is used to study the building thermal inertia and the amount of solar gain that have a great impact on the building performance. The linear regressions of the logarithmic differences of indoor temperature with respect to the outdoor ambience were obtained for different days as a parameter which is directly related to the effect of building thermal inertia.

Keywords : Zero Energy Building; Thermal inertia; Solar gain.

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