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Energy Conservation Measure in RDP House In South Africa

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Abstract content
 (Max 300 words)

Thermal efficiency of a building is primarily affected by meteorological factors surrounding the building. The indoor temperature distribution of RDP (Reconstruction and development program) houses in South Africa is strongly affected by the outdoor weather conditions. This is due to the low quality (low R-value) materials used in constructing the house. According to TIASA (Thermal Insulation Association of South Africa) approximately 24% of heat is lost through walls in an un-insulated home. Therefore good thermal insulated walls can minimize the influence of the outdoor weather condition on the indoor temperature distribution of the building. In this study the effect of the walls on the heat flow dynamics was analyzed and ultimately the building thermal efficiency was evaluated. A RDP house was monitored for one year but for simplicity this paper will present results over one week only. A number of sensors were installed to monitor indoor and outdoor temperatures, indoor and outdoor relative humidity, wind speed and direction, and solar radiation. Indoor and outdoor surface wall temperatures were also monitored. A thermal lag of 2 hours and temperature difference of 1.73oC were observed between the indoor and outdoor surface wall temperature. The average percentage difference between the outdoor surface wall temperature and the indoor wall surface temperature is 13%. A graphical observation shows a linear relationship between the indoor temperature and solar radiation. From these observations it is indicated that the rate of heat transfer through the walls of the building is high. A detailed and conclusive report containing the thermal properties of the wall will be presented in the final paper.

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