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USING PASSIVE DESIGN STRATEGIES TO IMPROVE THERMAL PERFORMANCE OF SINGLE FAMILY HOUSES. COMPARATIVE STUDY

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Abstract

In recent years there is a general consensus on the issues regarding climate change and the exceeding CO_2 emissions, in which the housing sector plays a crucial role, prompting the need to rethink the way buildings are designed. Implementing ecological houses is most often achieved at very high costs and without a real concern for archetypical typologies, thus responding inadequately to main sustainability criteria regarding economy and society. Current research in the field of construction is targeting these aspects, with the purpose of achieving near zero energy houses with affordable costs and integrating cultural values. In this context, the main objective of the research has been the development of a highly energy efficient single-family dwelling, in accordance with the Romanian housing tradition, with minimum impact on the environment and also economically accessible to different social categories. In order to accomplish this goal several strategies have been implemented, such as: use of natural local materials (wool, wood and clay), revival of traditional construction techniques, use of thermal mass for construction elements and integration of solar passive design. Multi-criteria energy simulations have been performed for the optimisation of the proposed design.

Key words: near zero energy buildings, renewable resources, sustainability assessment methods, traditional materials

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