

Recognizing Module's Role in Traditional Houses Design in term of passive Cooling (Case Study: Traditional Houses of Ghajar in Shiraz)

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Abstract

The promotion of technology and science is one of the Manifestations of community development and is one of the main programs in developing countries. Following this development limitations and problems also appear. Due to advances in technology and consequently increasing energy consumption, especially in the housing sector, numerous issues including costs and environmental pollution, arise. In parallel to these issues in recent decades, in the design of small and medium-sized country houses, the calculations of the installation engineer related to comfort and low energy consumption have received little attention. Whereas in the past, according to traditional Iranian architectural patterns, passive cooling without energy consumption has been the most important part of providing comfort in hot and dry climates. Also, it seems to be a particular link between the architectural design patterns formed by geometrical proportions and the climatic design that made the design faster and less neglected to provide comfort. However, today, with advanced computing technologies, we still see numerous buildings with severe deficiencies in climate design. This article assumes that there is a significant geometric structure from the perspective of static cooling in the traditional houses of Shiraz, seeking to find the relationship between the geometric structure of the architectural design to detect the optimal conditions of comfort with the lowest energy consumption and the fastest design time. In this regard, evaluating past designs with a point of view of energy based on new standards is a priority for the research path. The research method is descriptive-analytical and due to variation in passive cooling techniques and methods, along with computer analysis. After selecting the samples according to the criteria and extracting the geometric design pattern, base model production and energy analysis with the use of Design Builder software are performed, which enables the evaluation of the energy level of houses by adaptation of the analysis to the Iranian energy classification standard. Finally, it can be concluded that the geometrical and structural patterns used in the selected homes are significantly consistent with the comfort conditions. In other words, the numerical proportions available at "Peymoon", could produce a structure of dimensions and coexistence of components at the time of architectural designing that, in addition to meeting the structural and aesthetic requirements, were responsive to current energy consumption standards. At the time of the designing of the buildings, due to the lack of installation systems, this privilege was obtained only through static methods. In the performed analyzes, all extracted base patterns without any change in the components conducted Energy class label C. Next; it was possible to upgrade to B and A levels by optimizing the structure with thermal Insulation and double glazed window, etc. In the end, we can say that the modern architectural design inspired by the "peymoon" theory can increase the quality of energy consumption in the buildings with high speed and ease. So if in today's buildings, in the architectural design process, we use a pattern-based approach to the peymoon structure, at least in possible parts such as facades or general geometry⁴ Not only can design time be reduced, but even without the need for installation engineer calculations in the energy field (which is usually eliminated in the design of small and sometimes medium-sized houses) much better conditions can be achieved in terms of energy efficiency.

Keyword: Peymoon, passive Cooling, Traditional Architecture, Design Builder, Qajar Homes in Shiraz.

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