



An Analytical Study on the Effect of envelope's physical parameters on the Visual Comfort of Traditional housing in hot and Dry Climate of Iran (Case Study: five-door rooms in Yazd Traditional Houses)

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Abstract

Daylight is generally thought to improve feelings of health, wellbeing and alertness; however, if visual discomfort occurs, these benefits are likely to be negated. But if visual discomfort occurs, these benefits are likely to be negated. In other words, the presence of daylight is not always a positive one. As buildings are being designed with greater percentages of glazing there is a new interest in avoiding visual discomfort. In educational environments, due to the high level of visual activity throughout the day, consideration to light, and especially to daylight, is very important. Activities in classes with low visual comfort, in the long term, create physical and psychological problems for occupants in educational environments. In day lighting design, visual discomfort should be considered as a problem to achieve the benefits of utilizing natural light source in buildings.

While most lighting research focuses on energy efficiency, it's not the only issue in design of lighting scenes for building, but also visual comfort is equally important. Besides sufficient daylight quantity, visual comfort is increasingly concerned in building day lighting design procedures. To guide the design work, it is necessary for day lighting researcher to quantify visual comfort issues under daylight conditions with validated metrics and thresholds will progress the design industry. In this study, five-door rooms, the main room of occupant activity in Yazd traditional houses, were divided base on their position and the dimensions of the model were determined based on the average size of this space. By verifying the energy performance and environmental sustainability of Yazd traditional houses, it is worth noting how these buildings response to the visual comfort function and whether the envelope parameters provide sufficient visual comfort for occupant. At the first step, ASE and sDA as two dynamic metrics that verified by LEED, were first measured in the current situation to evaluate the visual comfort. Then these metrics were used to assess visual comfort in other situation, contain with non-shading, non-colored glass and non-shading/colored glass. With comparing the result with current situation, the effect of these parameters on visual comfort was obtained. The results show that LEED approval is only available in the current situation in north-west facing. At the next step, glare was evaluated between the hours of 8-15 hours in the position of a person sitting near the wall and during the three days, winter solstice, summer solstice and equinox (autumn), and it was observed that only in the present situation in all three periods, glare is imperceptible. So, by eliminating the envelope's physical parameters, visual comfort is disturbed and the current envelope's parameters are appropriate response to the visual comfort.

Keyword: Envelope's physical parameters, visual comfort, five-door room, hot and dry climate, traditional houses

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