

Comparison of Illuminance Levels in Old Omani and Portuguese Forts in Oman

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Abstract : Nowadays the reduction of the energy consumed by buildings to achieve mainly the thermal comfort for the occupants represent the main concern for architects and building designers. The common and traditional solution to achieve this target is the design of a highly insulated envelope and reduce the opening and the transparent elements such windows. However, this will lead to the artificial lighting system to consume more energy to compensate the lack of natural lighting coming through the glazed parts of the building envelope. Therefore, a good balance between sufficient daylight and control thermal heat through the building envelope should be considered for energy saving purpose. To achieve a better indoor environment the windows size and spacing including the interior finishing and the location of the partition must be assessed accurately. Daylighting is the controlled admission of natural light into space through windows and transparent elements of the building envelope which helps create a visually stimulating and productive environment for building occupants. The main concern is not to provide enough daylight to an occupied space, but how to achieve this without any undesirable side effect. Indeed, the glare is a major problem in glazed façade buildings, and this could be reduced by using tinted windows. The main target of this research is to investigate the daylight adequacy of functional needs in old Omani Forts and how they have been designed and built to avoid glare and overheating with the appropriate window-to-floor ratio. Because more windows do not automatically result in more daylighting but that is natural light has been controlled and distributed properly throughout the space. Spaces from different Omani and Portuguese Forts under the same climate conditions are considered in order to compare the daylight illuminance levels and examine the similarities and differences in visual attributes between them. The result of this study indicates that lighting preference is not universal and people from different geographical locations are adapted to certain illuminance levels. Therefore, the standards could not be generalized for the entire world. This would be useful to practitioners who are designing to effectively address the diversity of user's lighting levels preferences in our globally connected society.

Keywords : day lighting, energy, forts, thermal comfort

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