

Bioclimatic parameters in the design of contemporary buildings: the proposal for the new Town Hall of Deryneia, Cyprus

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Extended abstract

A. Introduction

This study presents the process of the design proposal for the new Town-Hall of Deryneia, Cyprus. Deryneia is a “divided” municipality since 1974 and for this reason the proposed building had to satisfy, apart from the aforementioned environmental and architectural demands, the need to express symbolically the political situation. The aim of the study is to evaluate the thermal behaviour, of the proposed architectural design both qualitatively and quantitatively with the use of software. More specifically, this evaluation concerns the thermal behaviour of the building shell, the passive heating and cooling strategies that are integrated to the design, as well as the achieved daylighting conditions. Daylighting conditions are analysed with the use of software for both overcast (winter) and clear (summer and intermediate seasons) sky conditions, in order to evaluate the influence of the roof skylights.

B. Architectural design principles

The proposed project for the new town-hall of the semi-occupied community of Deryneia seeks to create new connections while strengthening the existing ones. The building frames the occupied coast, visually connecting the here and there, past and present, presence with absence. The urban passage through the building connects the town centre, the heroes’ memorial and the open-air theater with the coastal zone. The building shell (epidermis) regulates its contact with the environment, the view and the climatic elements, sun and wind.

C. Bioclimatic design and environmental approach

The environmental approach of the design proposal is directly linked to selected bioclimatic design principles, which were derived from the climatic analysis of the area. The applied bioclimatic strategies form an integral part of the architectural design, and, in a passive way and thus compliant to the competition brief, provide improved thermal and visual comfort conditions. The building shell is formed by elements of appropriate geometric characteristics, which ensure winter southern insulation, provide adequate summer shading, enhance natural cross-ventilation and stack effect and contribute positively to the acoustic performance of the design.

D. Conclusions

Public buildings in general and town hall in particular, can help inform and educate the public on issues of environmental protection and energy efficiency. For this reason, their design and construction is of utmost importance.

The presented design proposal for the new Deryneia town hall tried to fulfil, in the best possible way, the aforementioned needs and demands. The project shows that it is possible to combine the principles of bioclimatic and environmentally-friendly architecture with the need for contemporary architectural design. For this to happen, designers have to take into consideration issues of climate, landscape and materials from the first stages of the design process. The proposal has to be continuously reviewed and validated in terms of thermal and visual comfort in order to design the spaces and define the details of systems and components.