

Lessons of Passive Environmental Design in the Sarabhai and Shodan Houses by Le Corbusier

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Abstract : The Shodan House and the Sarabhai House (Ahmedabad, India, 1954 and 1955, respectively) are considered some of the most important works of Le Corbusier produced in the last stage of his career. There are some academic publications that study the compositional and formal aspects of their architectural design, but there is no in-depth investigation into how the climatic conditions of this region were a determining factor in the design decisions implemented in these projects. This paper argues that Le Corbusier developed a specific architectural design strategy for these buildings based on scientific research on climate in the Indian context. This new language was informed by a pioneering study and interpretation of climatic data as a design methodology that would even involve the development of new design tools. This study investigated whether their use of climatic data meets values and levels of accuracy obtained with contemporary instruments and tools, such as Energy Plus weather data files and Climate Consultant. It also intended to find out if Le Corbusier's office's intentions and decisions were indeed appropriate and efficient for those climate conditions by assessing these projects using BIM models and energy performance simulations from Design Builder. Accurate models were built using original historical data through archival research. The outcome is to provide a new understanding of the environment of these houses through the combination of modern building science and architectural history. The results confirm that in these houses, it was achieved a model of low energy consumption. This paper contributes new evidence not only on exemplary modern architecture concerned with environmental performance but also on how it developed progressive thinking in this direction.

Keywords : bioclimatic architecture, Le Corbusier, Shodan, Sarabhai Houses

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