

PASSIVE COMPONENTS IN RESIDENTIAL BUILDINGS

M.Sala, L.Ceccherini Nelli
Department of Architectural Design
University of Florence
via Cavour 82
50129 Firenze
Italy

The research presented here, is an analysis of solar passive components and technical elements developed in projects and studies carried on by the bioclimatic design group (the authors and A.Gioli, A.Toti, A.Corsi, P.Puccetti) and aimed to investigate and to test a system of rules for projects of bioclimatic buildings in urban areas.

We catalogued design solutions according to the different residential models shape and orientation varying with regards to the different performances. Goals of our research were:

- a) to propose a catalogue of architectural solutions capable to integrate energy saving devices, such as by the capture of solar radiation in winter or by protecting from it in the other seasons, in the building scale.
- b) to improve thermal and lighting performance of buildings with use of passive solar components, technical and architectural elements for different situations of use.

The project presented here is multistorey apartment house in Greve in Chianti, close to Florence, at the altitude of 250 m., latitude 43.35 N, with daily degree 15.60. The orientation facing south of the hill suggested to test in this building several passive components, integrated in the same architecture, to study different performances in the same condition of use.

We gave special attention in ventilation solutions, for the hot clima in Greve during the summer, and we choice to use the cool passages that separate the building from the hill as ventilation device. The falling green from the upper terraces and the architectural form of terrace's edge protect windows from the direct radiation.

Greenhouses are designed as light structures to be removed in summer and also the windows frames can be removed forward or backward in the thickness of the wall. Mobile solar panels for warm water can be used as shadow device.

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