15 PLEA

Architecture in (R)Evolution

Bologna
9-11 September
2015

31st International
PLEA Conference

Book of Abstracts

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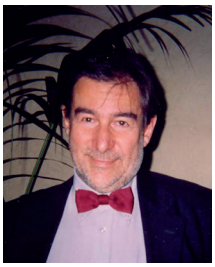
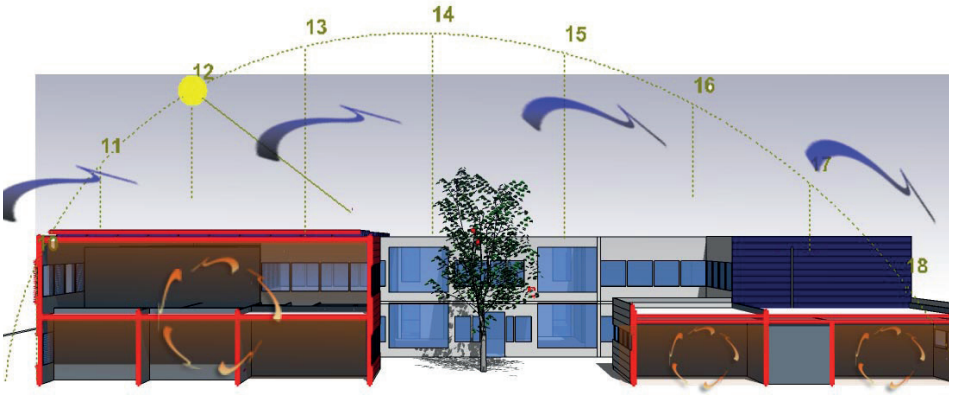


A GREEN SCHOOL FOR THE MED AREA: THE RESPONSIBLE RETROFITTING OF THE HIGH SCHOOL VALLISNERI IN LUCCA

Prof., Arch. Marco Sala, PhD, Arch. Rosa Romano

University of Florence, ABITA Research Centre



Bioclimatic section of Vallisneri School

WHICH ARE YOUR ARCHITECTURAL (R)SOLUTIONS TO THE SOCIAL, ENVIRONMENTAL AND ECONOMIC CHALLENGES OF TODAY?

Research Summary

Schools and academic buildings represent 17% of the European stock of buildings and approximately 12% of average, non-residential, energy consumption in Europe. Europe's school building stock is relatively old, often dilapidated and has poor energy performance. The European Energy Efficiency Directive (27/2012/EU) provides that, from 1 January 2014, 3% of public buildings should be refurbished every year, with the objective of energy efficiency. In this same proposal, the memorandum on schools and kindergartens explicitly mentions that this type of infrastructure should be renovated with a high standard of insulation to the envelope and roof, installing double glazing and replacing inefficient or obsolete heating systems. However the energy standards to achieve the objectives of the European legislation are still too much focused on continental climatic conditions and poorly adapted to Mediterranean areas. In particular, in order to reduce the time and the cost of the retrofit actions and to answer to the energy requirements of the EU directive, it is necessary to design and develop new adaptive and precast facades. These technological solutions, in fact, guarantee to regulate the solar radiation in summer and heat losses in winter and to increase the natural ventilation and daylighting also inside the school buildings located in the med area. In this paper is described the project of revamp of High School Vallisneri, a case study of the responsible retrofit, where a new adaptive envelope has been integrated as a dynamic environmental philter that can regulate the airflows, the solar radiation and the heat flows. The new façade, in particular, has developed as an innovative system with high-energy performances that can decrease the energy consumptions for heating, cooling and air exchange system, so to guarantee a high indoor air quality in the classrooms during all months of the year.

KEYWORDS: *Sustainable Schools, Energy Saving, Refurbishment Strategies, Adaptive envelope*