

# KARD Architects – A Sustainable School building to enhance sustainable lifestyles in Greece

## 1. The Company

Kard Architects was created in 2003 from the merge of two main architectural firms in Thessaloniki, Greece: Kouloukouris & Associates and Sempsis+Raidis architects. Both firms have more than 35 years of architectural and planning experience in almost all sectors of private and public development, with a strong focus on sustainable construction projects. Kard Architects has a core team of 15 people and works in partnership on a project basis with architects and construction companies. Their main product portfolio for the projects ranging from 2102-2105 was around 5 million Euros.

## 2. Sustainability Innovation

KARD Architects led the renovation, construction and development of a new Sustainable and Experiential Primary School in the city of Thessaloniki. The main goal of the project was to create a breakthrough and innovative building school concept, focusing on sustainability both from a construction perspective, but also in a much broader and holistic educational and experiential sense (for kids, parents and teachers themselves).



From a purely environmental perspective, the construction of the School aimed at providing a new approach to school building construction meeting latest bioclimatic requirements. This objective influenced how the building would be modified, constructed and operated (layout and use of natural light, for instance), but also which kind of construction materials and technologies would be selected and deployed. The final goal was to reach optimal levels of energy efficiency and integrated renewable energies while, at the same time providing unique features for a school that would be functional, safe and pleasant for the children to enhance the experiential and sustainable attributes of the education methodology.

Given the special characteristics of the School, a very participatory and open process was in place from the very beginning to get input and insights from stakeholders and users (School management, teachers, parents...). As result from this engagement effort and from a social

perspective, the project has enhanced sustainable education, setting new standards in sustainable lifestyles, mainly for the families involved, but also, and most importantly, influencing greatly the schooling building and educational system of Greece, provided the Primary School of AFS is considered benchmark in the country.

The following characteristics of the School regarding green and sustainable materials and technologies included:

- Bioclimatic architecture principles (south-facing facades and high insulation) and innovative solar systems, which were aimed at reducing energy demand for heating, cooling and hot water.
- New heating system: Installation of NG heating boilers, thermal zone control, cooling with energy efficient heat pump and mechanical ventilation with heat recovery
- Classrooms with natural ventilation and light and double glassed windows, improving indoor air quality – low CO<sub>2</sub> level in classrooms, Increased thermal comfort & adequate natural lighting in classrooms. Use fans to avoid use of air-conditioning in summer
- Bioclimatic interventions such as frames, joinery replacement and thermal insulation of building shell, including as well installation of insulated window frames and low-e glasses. Those interventions were aimed at aesthetically upgrade the buildings and improve structural malfunctions
- Use of glass shelters to protect kids from bad weather and rain, and at the same time, creating proper shadowing when the sunlight is too strong and not needed (hence avoiding excessive cooling costs in summer).
- The use of ecological materials in its construction: bricks and paints free from substances that may cause pollution to the building. All building and construction materials were renewable and locally sourced from areas as close to the school site as possible, to keep carbon footprint low.
- Tank for harvesting rainwater, which recycles the water used for watering plants in the school gardens using an automatic electricity control system
- Thematic gardens and veggies garden where designed so that the kids could have direct access to nature and benefit from experiential learning (growing its own vegetables and taking care of traditional botanic and aromatic Greek plants).
- Interactive facilities creation, such as photovoltaic systems, wind generator in order to promote experiential learning.

The goal was to reduce the existing energy performance by 70%, while creating special characteristics to allow interactivity of scholars and teachers in achieving new sustainability goals.

### **3. Engagement of End Users:**

Engagement of end users and co-creation of the project was achieved at almost all construction stages through multiple channels. Apart from strict environmental criteria, the construction and distribution of the School had to take into account the experiential aspect and especial teaching requirements of this educational methodology approach, aspect that required both a very open consultative process with users as well as a firm commitment to ecological-friendly and sustainable lifestyles of all the people involved, from kids to parents and teachers. As a result, users were part of the process from the very beginning and their input and insights in this co-development and co-creation effort was key not only to achieve

the final outcome, but a continuous source of new ideas and implementation of sustainable related side-projects. On the contrary, involvement of other stakeholders was not so determinant for the final outcome.

A very innovative approach to user insights integration, with the creation of a Core Team composed by the users, architects and school management was particularly useful in the smooth integration of users insights into the final product, meeting strict timelines for delivery.

In more detail the user integration at different stages of the project took place as follows:

### **Phase 1: BRIEFING STAGE (Opportunity/ Challenge recognition)**

At this stage user integration was done mainly through market research conducted to leading sustainable schools in the US and Europe to define main building characteristics that would be implemented.

Also there were users insights (potential parents) obtained through “mystery shopping” techniques in questionnaires the school management was making to visitors to several fairs and educational exhibitions they were attending. Those insights gave also important information on what kind of school the parents would like to take their kids to.

### **Phase 2: PRE- DESIGN (Ideation)**

In this phase, a lot of discussions, thought and exploration took place led by Kard Architects. There were several methods used by the company to achieve user integration at this stage, which were crucial to define scope, features, purpose and functionality of the School building. KARD Architects used questionnaires to main stakeholders and users (AFS management, AFS educational department members and teachers); and market research (visits to Greek schools to observe features and children behavior and technical research on similar buildings constructed in Dubai and the US).

### **Phase 3: SCHEMATIC DESIGN (Development)**

Face-to face interviews with teachers and parents took place at this stage, with generation of many ideas on the layout internal distribution and features of the school. The idea of a botanic garden and outside playground took shape in this phase and its design was undertaken by a user-parent, who happened to be exterior landscape designer.

Creation of core team Core Team: It soon became evident from the amount of ideas generated that in order to facilitate communication flow and effective decision-making the creation of a Core Team made of the main users and stakeholders representatives would be key to ensure rapid integration of user insights. The Core Team, composed by the two main architects, the Director of Construction and Environment, a teacher and a parent, established a cohesive relationship and a shared concept for the final building

### **Phase 4: BUILDING and CONSTRUCTION MONITORING (Development and Testing)**

In this phase, liaising with public authorities to obtain final building permits, taking final decisions on materials, budgets and timetables are extremely important. There was co-ownership of this part of the process by all the members of the Core Team. Good communication was critical, as the need for changes often arised. In this stage co-creation regarding final details in internal layouts was also very important.

### **Phase 5: COMPLETION and DELIVERY (Testing and Launch)**

One of the major outcomes of the project is that all users agree that innovation is an open and continuous process and a truly participative one. Many demands raised by the users were not only been integrated into the project development, but also have been source of new innovations. At this stage, a media library and new glass shelters were introduced after taking into consideration insights and comments of users (including the study of kids behavior once the school opened).

### **4. A school business construction project as catalyst for enhancing sustainable lifestyles**

The project reinforced the view the company had regarding sustainable buildings and architecture as catalyst for creating a more sustainable society. While the main initial objective of the project was to reduce the environmental footprint of the School, the fact is that, through its students and active role of the teachers, the ecological footprint of the families has reduced as well. At the same time in an era of financial crisis, reducing the ecological footprint has resulted in reduced spending for running the school building.

Regarding behavioral changes, the parents clearly mentioned how the impact of the new education and the school building features was having a clear impact in the way the whole family perceived and living sustainability. Kids learning's are incorporated at family habits and become part of a learning process in which several issues are (re) considered: mobility behavior, water and energy management at home, recycling, shopping habits (favoring organic food and sustainable clothing) and even how they are spending leisure time (in direct contact with nature).

This seems to be a shared impact by all the families. Children are becoming sustainability teachers to their own parents.