

Snapshot

In detail

LOCATION

Dubai, UAE

CAPACITY

2,200 students

OPENED

First Phase 2015

DUE FOR COMPLETION

Second Phase 2016

Completion 2017

TOTAL PLOT SIZE

60,000sqm

GREEN RATING

MINERGIE-certified



SWISS INTERNATIONAL SCIENTIFIC SCHOOL IN DUBAI

Davina Munro pays a visit to SISD to understand what makes it the first low energy consumption building in the region

THE SWISS INTERNATIONAL SCIENTIFIC SCHOOL in Dubai is the first low-energy school in the region, consuming only one third the energy of standard buildings.

Gabriele Rossi, founder and partner at Archilab in Switzerland, says that one of the objectives of the client was to find an architectural language that integrated Swiss culture with local Arab traditions. To do that, they had to find common ground between the two cultures. They realised that the first link they had was the need to protect themselves from the extreme external climate.

He explains, "In villages in Switzerland, buildings are built close to each other and have narrow roads to protect residents from strong cold winds. In the Middle East, there is almost the same tendency when cities are built. The buildings are very compact and are close to each other in order to create shadows and avoid too much heating through direct sunlight.

That was the second element that we were working on that creates a link between Swiss and Arab culture."

Hence, besides the architectural challenge of a contemporary campus design, and the research done to enhance the school's efficiency, a lot of effort was put into reaching the minimal energy impact while ensuring the maximum user comfort. All the buildings in the campus are therefore designed with a high-grade envelope with air tightness and the highest insulation standards, to reduce air loss as well as heat transfer, known as thermal bridge.

At the same time, light transmission is optimised to reduce electricity usage. The building's energy consumption is certified at 34.9KwH/sqm/year; a regular building consumes more than 100KwH/sqm/year. The school has thus received the region's first MINERGIE certificate, a Swiss label awarded to low energy consumption buildings.

Sustainability Consultants

ARCHILAB

To ensure that the concept of MINERGIE was combined in the building design, Swiss-based Archilabs was appointed. The team had to first ensure that the building was well insulated, with the ventilation constantly refreshing the air inside. The idea was to create an envelope for the building that was airtight so that there was no penetration of heat or cold from the exterior. Archilab had to be careful with the size and orientation of the windows, to prevent high solar gain from entering the building and at the same time allow as much daylight in as possible. They played with the location of the windows and had to strike a balance between the amount of daylight and artificial lighting required. Another thing needed was a double door entry system, with a buffer zone between the two entry doors. This buffer zone contains an air-pull system that sucks in any exterior air that has come in through the first set of doors, thereby preventing it from entering the building and bringing in humidity. In addition, an internal mechanical ventilation system was installed to absorb the humid air in all the rooms, bring it to a power pump and then re-circulate it in the building. This creates a continuous system of ventilation.

Project Management

HEPHER PROJECT MANAGEMENT

As representatives of the client, Hepher Project Management in Dubai had to help set up the procurement strategy, contractual strategy and engagement with the contractor. The engagement was a design and build contract, so Hepher helped the contractor with the selection of consultants. As the interface between the contractor, consultants and the client during the design phase, Hepher managed the cost and contract. The objective was to get the school built for the 2015-16 academic year, which gave them 19 months to finish the first phase. To ensure that the MINERGIE standard was maintained, the company worked closely with the contractor, who was instrumental in finding solutions to ensure that power consumption was minimised. The contractor was involved with the selection of various construction methods to ensure that the building was highly insulated and as impermeable as possible. Since most buildings in Dubai are very permeable, and a lot of cool energy is lost by air flowing out of buildings, the design team and the contractor sought a slightly different construction technique that made the building more airtight. Other factors, such as electric equipment, lighting and motors, were selected to minimise power consumption.



At SISD, a specific kind of moss has been installed on the walls to purify and refresh the air inside the building.



6 December 2015
The Terrace Between the Towers,
Jumeirah Emirates Towers
www.meconsultantawards.com

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Design Consultants

DSA ARCHITECTS

Dubai-based DSA Architects was tasked with looking at the original design from a fresh perspective that would be appealing for the client's brand. The brief was to create a modern learning space that would be fun and inspiring for children to be educated in.

To maintain MINERGIE standards, they had to engage with materials obtained in Sharjah, which lowered costs as there was no need to import a large range of materials.

One of the principal contributors that helped keep the project on budget was jihan, a composite walling system that is pre-manufactured and has an inner core of polystyrene, or in this case neoprene and a wire matrix.

This meant that the entire wall could be easily moved to a place and then simply rendered or plastered there. This gave them the U-Value that was predominant and helped in achieving the MINERGIE level.

Another interesting feature is the internal walling system, which is a lightweight partitioning system that allows rearrangement of the entire internal spatial arrangement. The rate at which education is changing, this allows for the space to adapt to other uses in future.

Infrastructure & Security

WME CONSULTANTS

The services provided by WME Consultants in Dubai included structural engineering, building services, AV/IT + security engineering, road and infrastructure engineering and being the architect of record.

Keeping in mind that education in this school was highly interactive, they needed to ensure easy access to the internet. WiFi was made available everywhere, and iPad connections were put in place for all students. IT platforms needed to be user-friendly for teachers and students to access from remote locations.

Since using natural lighting was a priority, daylight and lighting sensors were installed everywhere. When adequate daylight is available in a room or when nobody is in an area, the lights switch off automatically, to prevent excessive usage. Additionally, CO2 monitoring was installed on the ventilation system.

In terms of security, CCTV has been installed. A full building management system has also been installed, which means all of the systems are monitored and can be controlled centrally, either inside the school or remotely. There's also energy metering all over the building, so if there is excessive usage anywhere, the reason can be seen. Lastly, acoustics were worked on to prevent reverberation. ●



Daylight and lighting sensors are installed throughout the school that switch lights off automatically to prevent excessive usage.



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Research has shown that reading scores for children in 'noisy' classrooms are around 1 year behind those in 'quiet' classrooms
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