



PEARL ACADEMY OF FASHION

JAIPUR, RAJASTHAN

Mani Rastogi and Sonali Rastogi, founder partners, Morphogenesis
Mani specialises in energy and environmental studies and works with urban policymakers to spearhead initiatives with an emphasis on environmental sensibility and social welfare. Sonali works across a diverse canvas ranging from architecture to urban design, landscape and interior design. She is passionately interested in the materiality and craft in architecture, and is deeply invested in the detail of building.

They are the founder partners of Morphogenesis, ranked among the world's top 100 architectural firms in 2015 by the UK-based magazine *Building Design*.

JAIPUR CITY'S EXTREME DESERT-TYPE climate makes it imperative for most modern buildings to be artificially air conditioned both in summer and winter. The campus of the design institute Pearl Academy of Fashion, in the barren Kukas Industrial Area some 20 km off the city, is geared towards creating an environmentally responsive passive habitat by virtue of its design.

"We have delved into Rajasthan's rich traditional architectural wisdom to create a naturally air-conditioned building that serves the needs of a creative student body for an interactive space, while blending the indoors with the outdoors seamlessly. Everything in the project is environmentally sustainable," says Mani Rastogi, founder partner of design firm Morphogenesis.

The edifice is simple, a rectangular building that insulates the institute from the surrounding industrial area.

Client:
PEARL ACADEMY OF FASHION

Architect:
MORPHOGENESIS

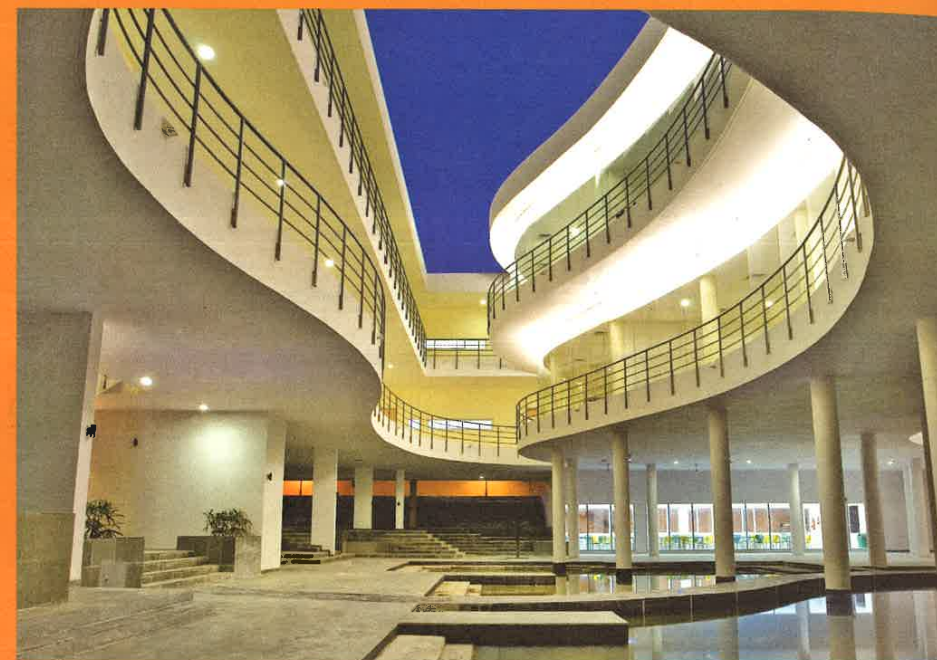
Year of completion:
2008

Built-up area:
12,542 sq m

Cost: NA

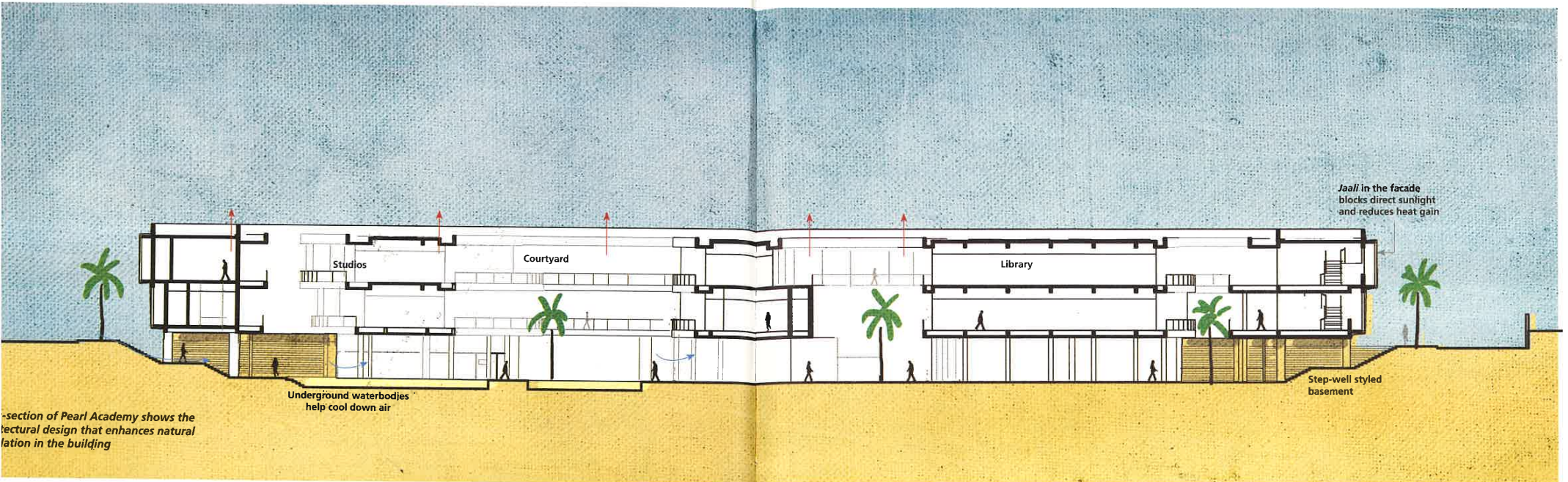
Occupancy:
600 students and
100 staff

Photographs: Edmund Sumner, Andre Fanthome, Vibhor Yadav and Morphogenesis



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Mani Rastogi, architect



Reinventing traditional wisdom

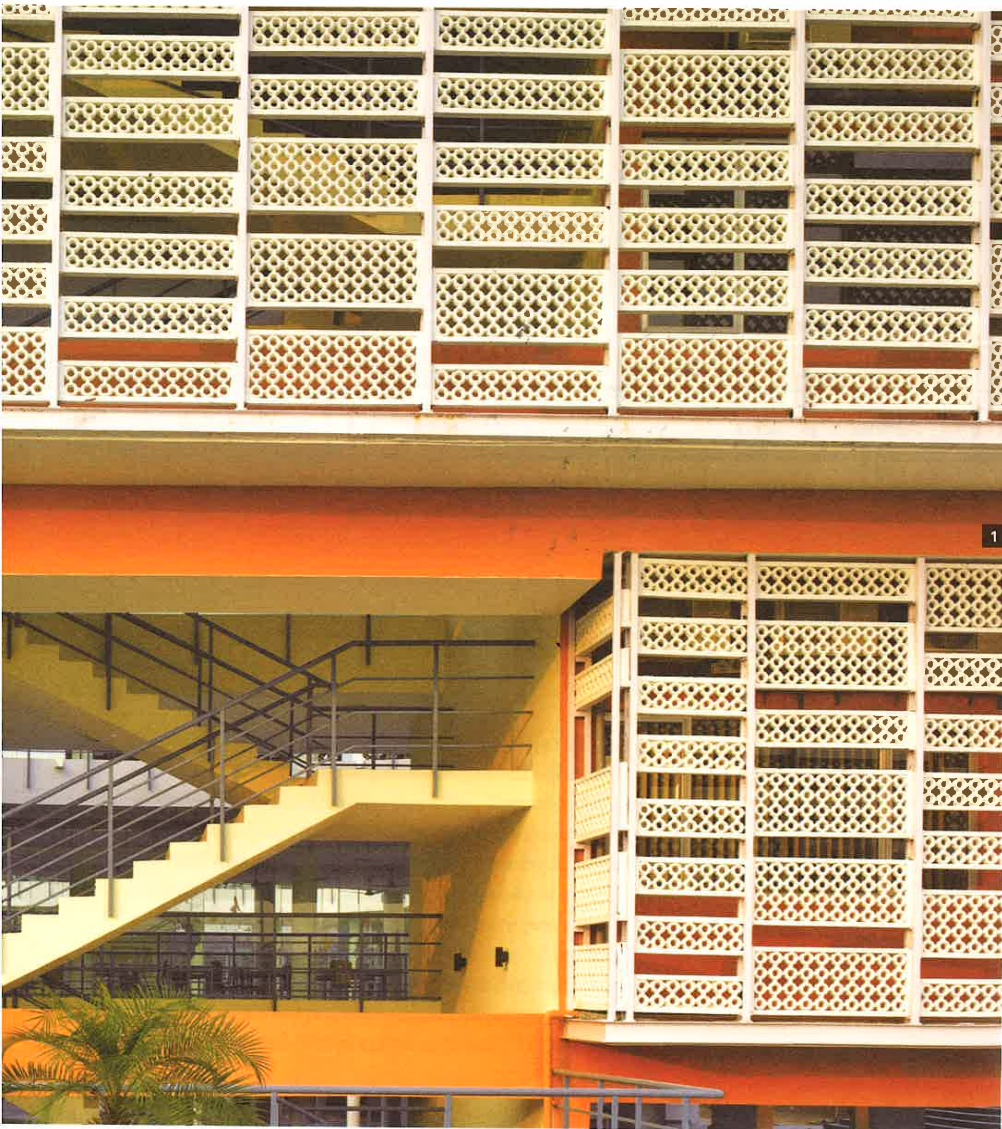
A traditional Indian technique of thermal insulation is employed at the academy. Inverted earthen pots (*matkas*), about 35 cm in diameter, are placed 2.5 cm apart on the flat roof. The spaces between them are filled with sand and broken bricks and covered with a thin layer of concrete.

Jaalis, traditional Rajasthani filigree screens, serve as a 'double-skin' or thermal buffer between the denizens of the building and the exterior, with filtered light seeping through. A 1.2 m gap between the screen and outdoor wall of the classrooms reduces direct heat gain. Drip channels on the inside of the screen provide

more evaporative cooling. The traditional building technique was modernised as computer models were used to determine the optimum density of screen pattern to provide maximum cooling.

The central courtyard is carved out so that it allows daylight and ventilation but prevents direct solar radiation. It provides shade and filtered daylight in the hot summer months and allows radiation to enter only in winters when the temperature drops to as low as 2°C.

The temperature of the earth three metre below the surface is equivalent to the annual average temperature of the outdoor air, which is about 25°C. Based on this principle, the underbelly—a



1. A modern interpretation of traditional Rajasthani jaalis serves as 'double skin', a thermal buffer between the building and the outside sun, allowing in only filtered daylight.
2. An external view of the building.
3. The basement and the courtyard are scooped out and a step well created to naturally cool the micro-climate of the building by evaporative cooling.



basement and the courtyard above— was scooped out and a step well created to naturally cool the micro-climate of the building by evaporative cooling. Rainwater and recycled water from the treatment plant feeds the step well throughout the year. This, along with evaporative cooling, achieves stable temperatures of about 27°C inside the structure without the use of air conditioning, even when outside temperatures hit high 40s.

The underbelly, which forms the anchor for the project, is thermally banked on all sides and serves as a large student recreation and exhibition zone. During the night, when the desert temperatures drop, the floor dissipates the heat to the surroundings, keeping the area relatively thermally comfortable. "These passive design interventions have helped the building achieve an EPI (Energy Performance Index) of 25 compared to the official EPI baseline of 90," say Rastogi.