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GREEN CONSTRUCTION+DESIGN

The Complete Guide to Sustainable Architecture and Design

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Academy of Social Entrepreneurship

HIH Academy, Kaliyanoor, Tamilnadu

The academy has been designed to be environmentally sustainable right from concept to execution.

Design Brief:

The academy was designed for Hand in Hand India, an NGO working extensively in the field of rural development, especially focusing on the upliftment of women and children. The client's brief for the campus included an eco-friendly setting for offering educational courses and training programmes to promote social entrepreneurship, a skill that is needed to ensure the effective and efficient future development of rural India.

Project Description:

The campus includes the main training centre which



A photograph of the front façade of the training building showing the client's logo integrated into the building design along with the custom tiles made using the client's greeting card design.

consists of training halls, library, a mini auditorium, staff lounges and administrative offices; a dining hall and central kitchen; and a central green space that houses a small temple, open air theatre and a rain water harvesting pond. At this juncture, construction of the main training centre building and temple have been completed. The kitchen / dining building is under construction.

The Site:

The 1.5 acre site is located at Kaliyanur, a village on the outskirts of Kanchipuram, a small town in Tamil Nadu that it is famous for its beautiful temples and silk sarees. The site was a barren field which had been used for agriculture in the past but had been uncultivated for over 10 years.

Design Intent:

The site is very linear and our first goal was to ensure a continuous line of sight all the way from the front to the back of the property. Adequate ventilation was ensured by opening up the buildings from the south (prevailing wind direction) to the north thereby creating a breezeway through the buildings. A central courtyard formed a key design feature of the training centre that fostered social interaction while facilitating the exhaust of warm air from interior spaces. The courtyard, landscaped yards and balconies encouraged physical and visual access to the outdoor environment at all times.

Building form:

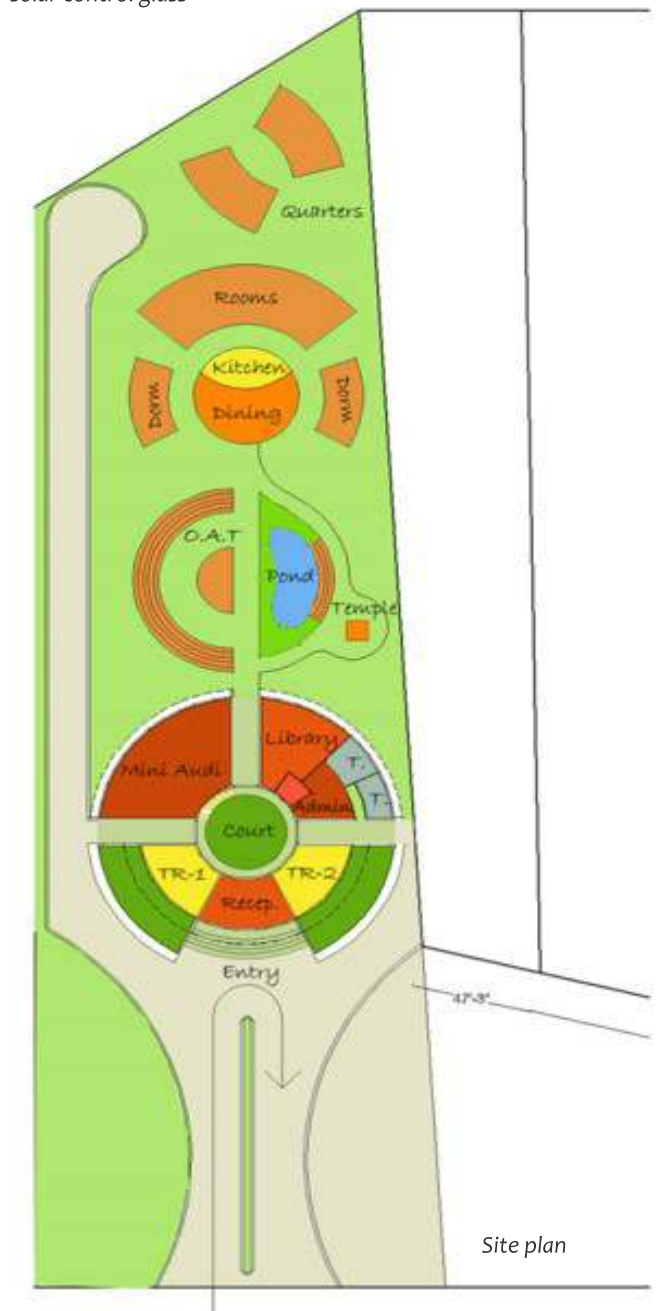
The main training centre is a circular form cut out in the centre and split across the diameter, forming an efficient solid-void relationship, thus creating indoor-outdoor spaces for an interesting learning experience.



The unplastered exterior wall constructed from hollow terracotta blocks.



A photograph of the large, well shaded windows fitted with solar control glass



Site plan



The radial shape for all training halls served as an ideal learning environment facilitating group interaction through enhanced visibility.

Environmental Sustainability:

The academy has been designed to be environmentally sustainable right from concept to execution. Some of the eco-factors that were incorporated into the design were energy efficiency, water conservation, sensitive material use and indoor environment quality. The project has been designed in compliance with the IGBC New Green Building rating standard.

1. **Energy Efficiency:** Passive solar strategies were incorporated into the building design right from the concept stage with the goal of minimizing the need for space conditioning. The buildings were designed to be naturally ventilated with space conditioning required minimally during summer months only.

The building shape, orientation and space planning was done to ensure adequate natural light and abundant ventilation. The central courtyard has openings to the exterior in the directions of the

prevailing winds. This keeps the courtyard breezy and helps in exhausting hot air from the interior spaces.

Large windows that are well shaded allow for natural light and ventilation without solar heat gain and glare. Solar control glass that eliminates 50% of the heat gain while allowing natural light has been used for all windows. These measures help achieve adequate natural light in the interior spaces without glare and the use of blinds. This helps avoid the use of artificial lights during daytime.

Insulating hollow terracotta blocks used for exterior walls and a high, insulated roof also help minimize heat ingress and keep the interior spaces cool despite the warm and humid climate of Kaliyanur. These measures along with good cross ventilation due to the window design have ensured that air-conditioning is not required except during the very hot summer months.

Other energy efficiency measures include high efficiency VRV air-conditioners and energy efficient lights. A solar photo-voltaic energy generation system has been planned to offset a large part of



Rendering of the roof form.



The Countryward

the energy consumption of the academy.

2. **Sensitive material use:** The primary goal was to avoid unnecessary material use and to minimize the use of high energy materials. Exterior walls were left unplastered to save on material and cost. Cement flooring in training rooms helped avoid the unnecessary use of additional flooring material and cutting of tiles due to the circular building form. Avoidance of RCC lintels by use of brick arches also helped reduce cement and steel cost. Finally, a sheet metal roof with insulation helped significantly in reducing the quantity of RCC used in the project.
3. **Indoor environment quality:** All working areas of the academy have been designed to achieve adequate natural light and bring in abundant fresh air, which provides a healthy and productive indoor environment. Low VOC paints have been used to minimize toxins in the indoor environment.
4. **Water Conservation:** Dual-flush water closets and low-flow plumbing fixtures that are water efficient have been installed to minimize water use. Rain water harvesting has also been implemented on site. On the anvil is a waste water treatment system

which is likely to be installed this year. This will allow the reuse of waste water for purposes such as landscape watering, floor washing, etc.

5. **Environmental measures during construction:** As the site was once an agricultural field, fertile top soil was stripped off from the construction areas and preserved. The preserved top soil will be reused for landscaping after the completion of all construction work on site.

Other Unique Design features: The client's logo, cut out in stone, forms an interesting landscape feature as well as creates a unique identity for the building. Hand-made card designs from the rural development initiatives were chosen and customized in the form of tiles that was used for façade cladding. This formed another feature that brings out a sense of identity for the building and its occupants.

Hand-in-Hand's Academy of Social Entrepreneurship today stands as an aesthetic and environmentally sustainable model of development in Kanchipuram, reflecting not only the ethos of Hand-in-Hand but also the rich, cultural heritage of the people and place served by the organization.

Architect's Profile

Anupama Mohanram is an architect with a passion for environmental sustainability. She has an undergraduate degree in Architecture from the School of Architecture and Planning, Anna University, Chennai after which she moved to the USA to pursue a Master's degree in Architecture from Kansas State University.

Post this phase, she worked as an architect in Chicago for ten years before moving back to Chennai India to start her own architecture firm, Green Evolution, which focuses on environmentally sustainable design and construction. Anupama is also a LEED Accredited Professional and a certified GRIHA Evaluator and Trainer.

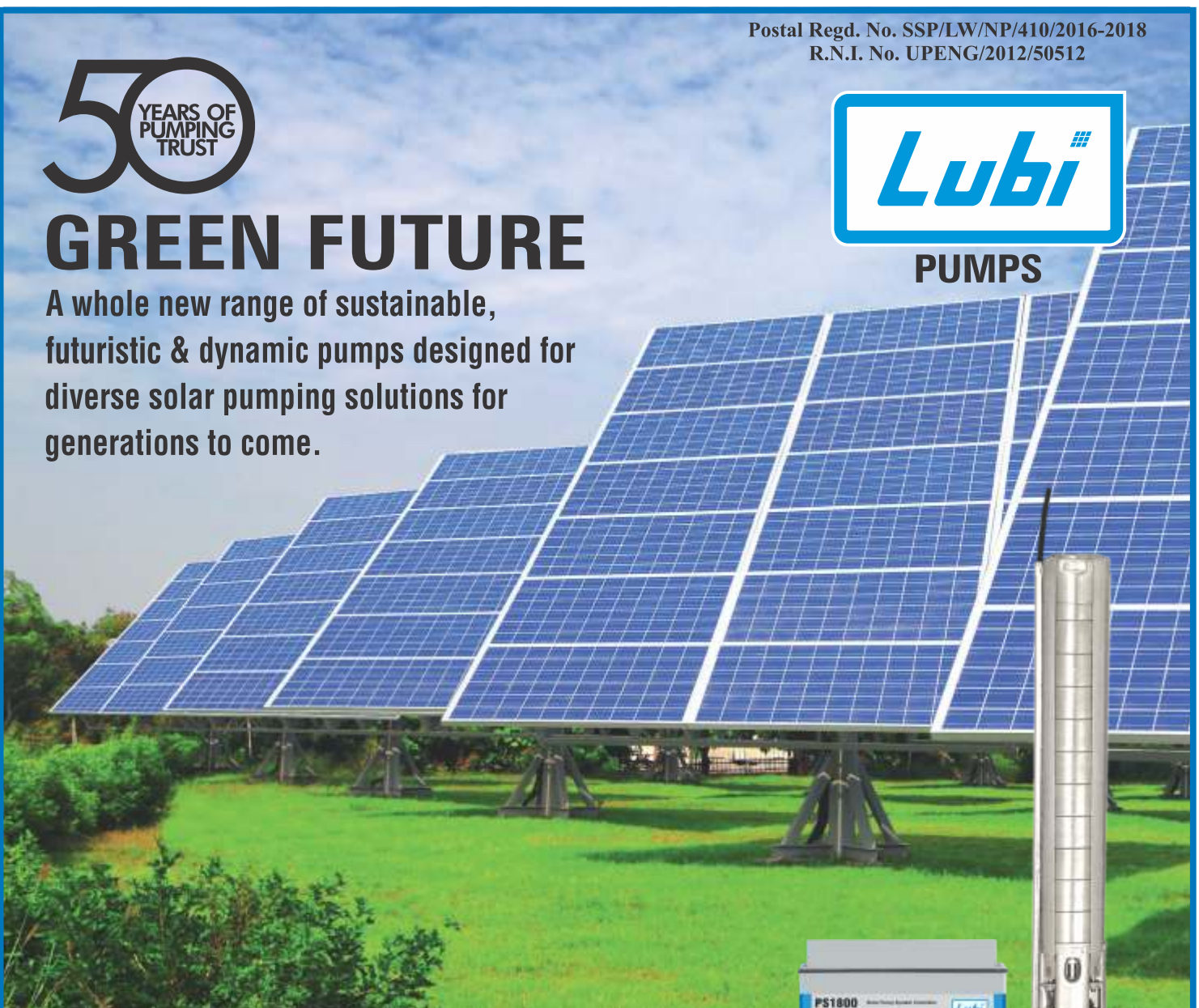


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