

Case Study
**NTU School of Art,
Design and Media**

Nanyang
Technological
University
(NTU)
Singapore



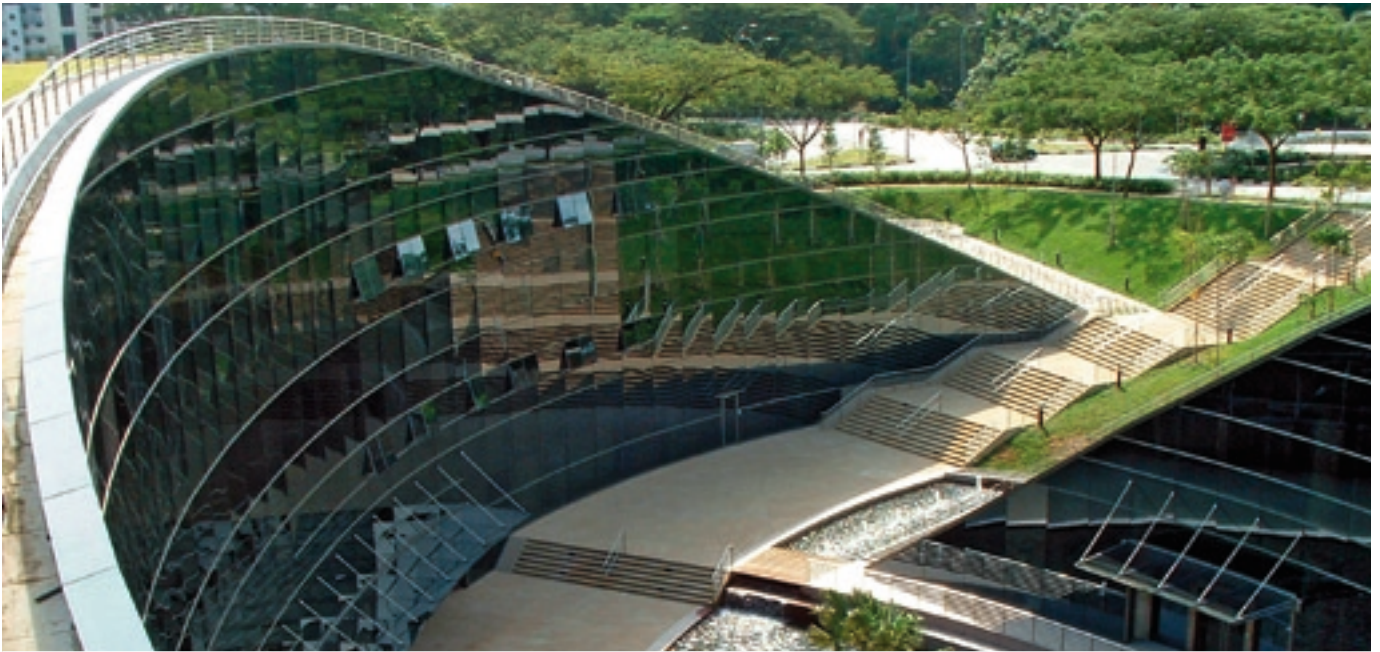
Design School for Future Designers

A design school in Singapore's Nanyang Technological University (NTU) is creating a stir with its unique architectural concept. One of the highlights of this building is its curved green roof.



Curve Roof and Facade

Curved Green Roof



Sunken Plaza

Art and design schools conjure up images of creatively designed buildings. NTU's new School of Art, Design and Media (ADM) is no exception: only that it is more imaginatively designed than others. This fascinating building has many interesting twists; an unusual curved green roof, a landscaped garden and a sleek curtain wall. These features imbue the building with exceptional appeal and transparency, adding richness and sensory depth to the architectural form.

The ADM building primarily consists of three interconnected blocks enclosing a sunken plaza, which is engulfed by a cascading pool and rich landscape. The highlight of the building is the verdant roof which weaves in and out of the ground. Design of the façade is a sleek glass curtain wall coupled with off-form concrete walls for a natural finish. On first impression the building seems to be very much a part of its lush green surround-

ings and comes across as a structure that grew from the ground. The main concern for the architects while designing the School of Art, Design and Media was to make the building of this school different from other conventional multi-storey buildings, in the campus and the city.

Dr Timothy Seow, Managing Director of **CPG-tss Studio, CPG Consultants**, the Lead Designer behind this project, says: "The idea was to make the architecture part of the landscape. We wanted a building that flirts with the landscape, not opposing it."



Main Roof

Distinctive Architecture



Mr. Hoong Bee Lok, Executive Vice President, CPG Consultants and the Principal Architect for this project, says that the site for the project was a wooded area and they had wanted to retain the green characteristic of this site even after the woods had been removed to make way for the school.

So in terms of design, the challenge was making a building that blends with its landscape rather than dominate it. Also being a school for future designers and artists the school had to have a distinctive architecture.

“When you look at the school you only see glass and grass”, says Dr Seow. The

most challenging aspect of the project was the construction of the roof, which is approximately 10,000 sqm. Conventionally, a green roof requires soil as a growing medium and the extent of its coverage would impose heavy loads on the building structure and foundations. On the onset, the architects have devised an unique greening system which allows the grass to grow and thrive on a thin layer of lightweight volcanic stones and sand. The entire composite section is barely 150 mm thick and incorporates a water absorption mat that constantly provides moisture to the roots, thus reducing the need to frequently water the grass.

All these sit on top of a preformed single-ply waterproofing membrane to ensure watertightness to the roof. alwitra’s EVALON® was chosen for its proven track record in tropical climate like Singapore’s and in addition for its plant root resistance as tested to FLL standard.

Unique Greening System



Green roof in modern architecture

Intertwining Roof Forms



People Involved:

Owner:

Nanyang Technological University

Architects:

CPG Consultants Pte Ltd

Structural Engineers:

CPG Consultants Pte Ltd

Main Contractor:

Teambuild Construction Pte Ltd

Waterproofing Specialist:

Elmich Pte Ltd

Completion Date:

June 2006



A Gem in the Forest



It took four months to complete the installation process, having had to face two challenges: first to keep the planting material light and second to green a roof that slopes as much as 45 degrees. This is probably the first time in Southeast Asia that a green roof with such a steep curve has been built.

The groundwork done by the landscape contracting firm before the installation of this green roof included several months of mock-up experiments. The architects have designed the greening on the roof to be eco-friendly so that it can combat the hot and sunny Singapore weather with the use of limited water.

The landscapers used a water mat that could absorb water during the showers and release it during a dry spell. The media used in this extensive roof also had the property of absorbing moisture as well as draining extra water. To prevent the shearing of steep roof the land-

scapers have used additional bracings on the roof.

A fine grass called Zoysia Matrella, usually used on golf courses, was used for this project. With its heavily matted root network, this grass forms a thick mat and is ideal for tropical weather. The fact that it can withstand heavy downpour was the most important reason why it was chosen by the architects and the landscape contracting firm.

To help students of this school to take advantage of this green roof, the architects took the decision of keeping a part of the grass roof open. The grass roof of this project not only enhances its visual appeal but also creates a communal space for students to interact.

At night, the building lights up like a lampshade and interior lighting streams through the glass curtain wall giving it an ethereal feel. It would not be too much to call this building “a gem in the forest”.

alwitra in brief:

alwitra is a leading German manufacturer of comprehensive flat roof systems. The wide product range comprises the waterproofing membranes EVALON® and EVALASTIC® as well as aluminium profiles for roof edge trims and integrated details such as rain-water outlets, vents and roof-lights. alwitra is a member of European Single-ply Waterproofing Association, Bruxelles, Belgium. The alwitra flat roof systems are so sophisticated and flexible that they can be implemented perfectly in various climatic zones and architectural concepts. Numerous architectural projects of high repute all around the globe document this impressively.



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