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June 2016

INSPIRING ARCHITECTURE & DESIGN

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The 17 sq-m Pod-Idladla compact home isn't about minimalism or no-frills economy – it's about the sheer joy of small spaces

+ Hong Kong to host ACA-17

Delegates from 19 countries across Asia will be flying in for the 17th Asian Congress of Architects in September

B House, Singapore
—p.14

Midwest Commodity Exchange Center, Xi'an
—p.19

Sina Plaza, Beijing
—p.22

Shouson Peak residence, HK
—p.30

Madera Hollywood, HK
—p.33

98 Wireless, Bangkok
—p.36

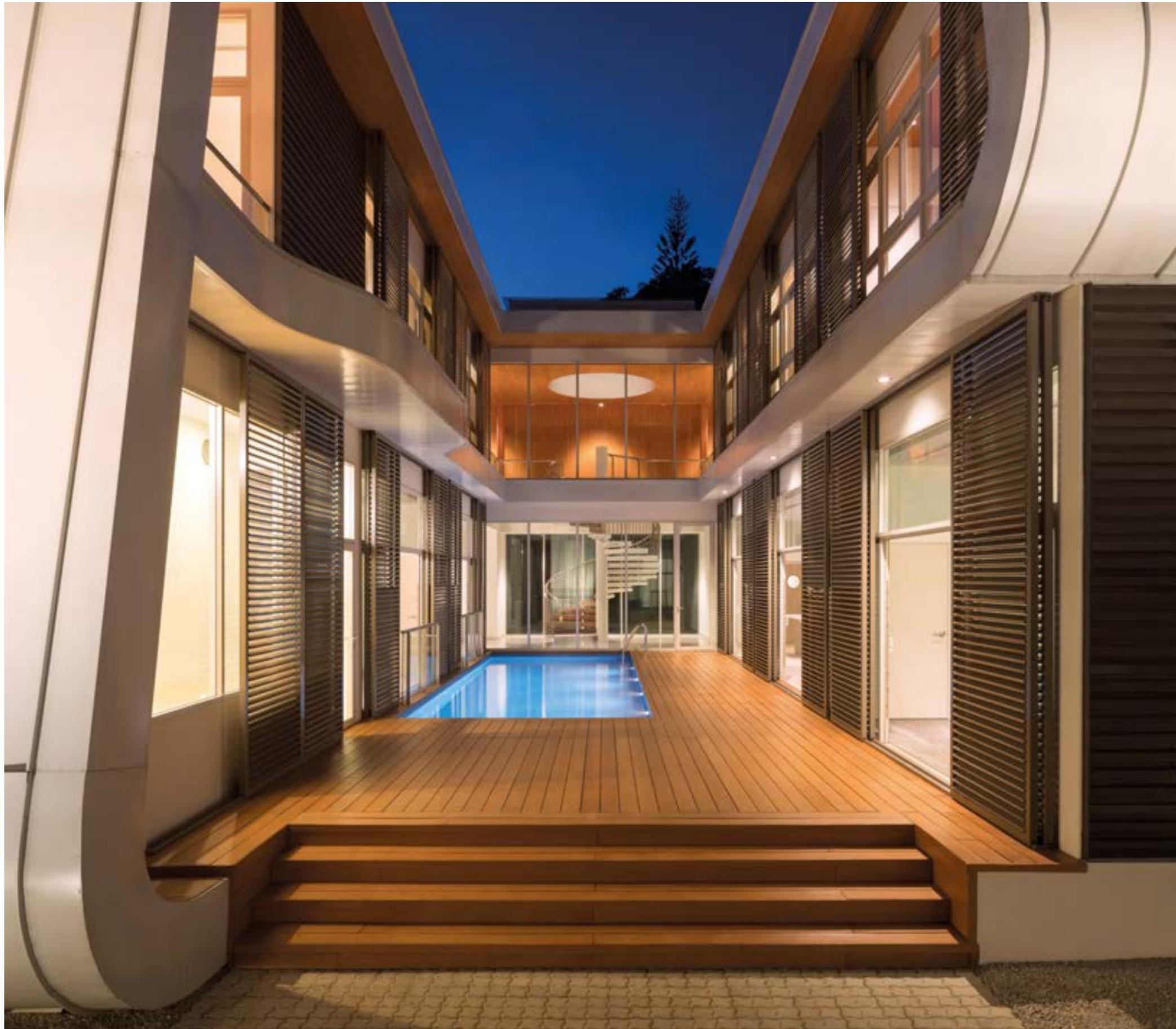
Ping An Finance Centre, Shenzhen
—p.48

Monsant Café, Jeju
—p.55

Christo's Floating Piers, Italy
—p.62



HKS48
US\$18
€15



THE POWER HOUSE

Singapore firm Pomeroy Studio's award-winning B House comprises twin residences that are not only energy-efficient but also act as power stations, supplying their inhabitants with more energy than they use

TEXT:
Michele Koh Morollo
PHOTOGRAPHY:
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B House is not just Singapore's first carbon-zero residential development, it's actually carbon-negative, meaning it generates more power than it uses. Designed by Pomeroy Studio, B House has also been awarded the highest honour for eco-friendly buildings in Singapore, the Building and Construction Authority's Green Mark Platinum Award.

The Studio's founder, Jason Pomeroy, explains that the average household energy consumption for a typical family of five is estimated at 12,500 kWh per year. A family of five living in B House however, would consume an average of 8,000 kWh per year, thanks to, among other things, 100 sq-m of polycrystalline photovoltaic solar panels on the roof of the house, which generate approximately 16,720 kWh per year.

"This means that B House effectively acts as power station providing surplus energy which could potentially be supplied back into the grid for income generation," he says.

Sited on a 17,500 sq-ft plot, B House consists of two conjoined five-bedroom residences that are about 5,400 sq-ft each, with an undulating façade made up mostly of recycled aluminium and reconstituted timber.

The idea for B House came to its owner Belinda Young, a Singaporean chartered certified accountant, when she saw a zero-carbon house called Idea House – Asia's first such prototype home – in Shah Alam, Malaysia, which Pomeroy had designed for Sime Darby in 2010.

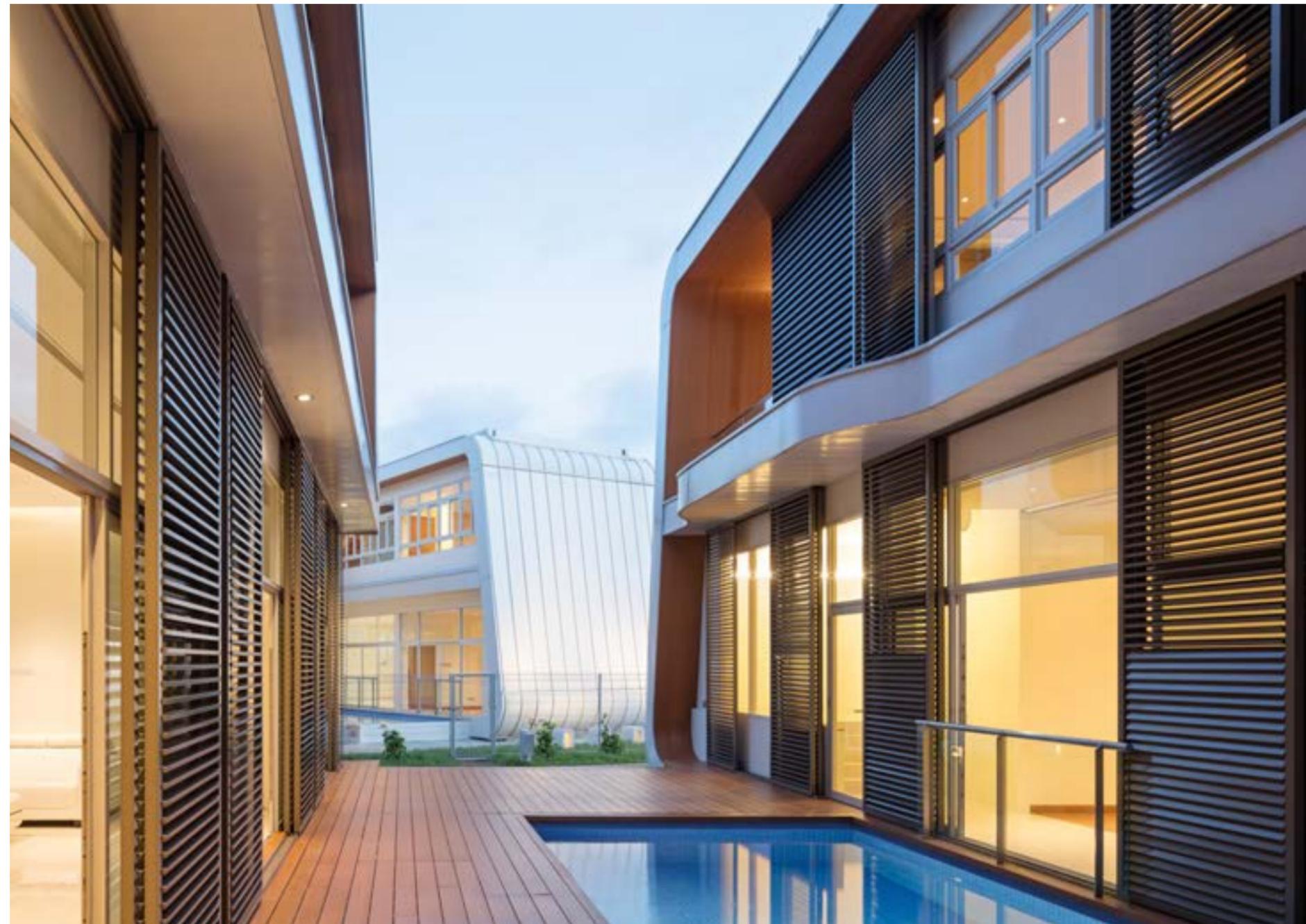
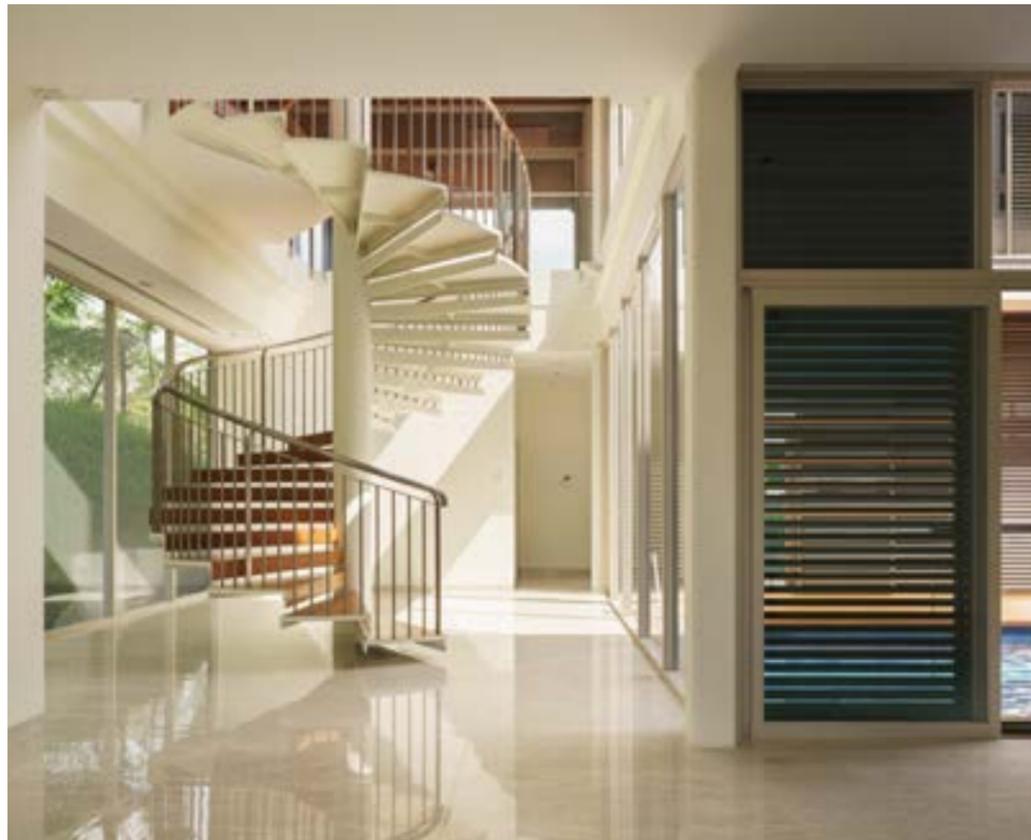
The central courtyard is strategically placed between the more public formal reception area and private areas; this allows it to act as an outdoor social space

“Just being a bit more conscious of our carbon footprint will go some way to addressing our carbon woes and help preserve our planet for future generations”

Young, whose family owned the plot of land where B House is sited, approached Pomeroy Studio and explained that she wanted to develop a house that would be highly sustainable in order to reduce energy and water bills. Inspired by Singapore's colonial black-and-white bungalows, B House takes what Pomeroy calls a “form matching climate” approach that embraces the climatic conditions of Singapore in order to reduce energy and water use.

“While the Idea House reinterpreted the techniques embedded in the Malay *kampung* [village] house, B House provided an opportunity for us to study the traditional black-and-white bungalow of Singapore,” says Pomeroy, an expert in sustainable design and zero-carbon development.

“These colonial bungalows feature generous roof overhangs, large verandahs for outdoor living and entertaining, and variable shutters that keep the sun out but allow the air to percolate within. Learning from its passive design techniques and space-planning principles allowed our subsequent reinterpretation for the 21st century tropical house.”



Low, medium and high-level windows have shutters that act like a series of valves, which can be opened and closed in multiple configurations to regulate airflow and provide shade

Left
Due to the modular design of the house, pre-fabricated sections were manufactured off-site, thus improving the quality of the structures while reducing wasteful off-cuts

The architect points out that colonial and Asian dwellings were marked by the presence of courtyards and verandahs, which served as places of social interaction whilst also cooling the buildings themselves. At B House, the breeze entering into the home through such spaces would be cooled by the surrounding foliage, while verandahs line both wings of the house, channeling cooler air into the interiors.

“The central courtyard is strategically placed between the more public formal reception area and private areas; this allows it to act as an outdoor social space, while ensuring that natural light and ventilation percolate into the interior spaces,” he adds.

In order to reduce sunlight entering and overheating B House,

the east- and west-facing sides, where the sun's rays are the strongest, are devoid of floor-to-ceiling windows. Instead, windows were positioned on the north and south façades, where natural breezes facilitate cross-ventilation. Airflow is further enhanced through strategically-placed window openings and high ceilings.

On the north and south façades are low, medium and high-level windows, and shutters that act like a series of valves, much like the black and white bungalows. These can be opened and closed in multiple configurations to regulate airflow, prevent rain, and provide shade while filtering light during the hottest or wettest seasons of the year.



The undulating façade is made up mostly of recycled aluminium and reconstituted timber

The north and south windows also help suffuse the interiors with natural light, which along with the help of skylights, reduces the need for electric lighting. Daylight penetration is further optimised through shallow floor plates that permit all habitable rooms to receive 100 per cent natural light.

According to Pomeroy, the strategic use of windows in combination with other tropical design elements such as shutters, verandahs, courtyards and high ceilings can bring temperatures down to a cool 23 degrees Celsius even during daylight hours. This creates an extremely pleasant atmosphere in the usually hot and humid tropical climate of Singapore, where average day time temperatures hover at around 31°C for most of the year.

The kit-of-parts construction method was another eco-friendly aspect of the project. Because the design of the house is modular, the pre-fabricated sections were manufactured off-site, thus improving the quality of the structures while reducing

wasteful off-cuts.

This process increased the speed and efficiency of construction by 50 per cent compared to similar sized residential buildings. Materials with low eco-toxicity and high recyclable content were used throughout the project, and water-harvesting equipment with a water-saving system forecast to save up to 465 cubic metres of water per year was also installed.

In recent years, carbon-negative buildings have been receiving more attention as the architecturally intelligent way to combat climate change. Buildings with low carbon credentials not only help the environment by emitting less carbon, they also contribute to the health and wellbeing of their inhabitants, and inform the public of the difference they too could make by altering their habitats.

“Just being a bit more conscious of our carbon footprint will go some way to addressing our carbon woes and help preserve our planet for future generations,” says Pomeroy. ●