

# This Malaysian bungalow's hydroponic wall plays a key role in green design



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DESIGN Premium

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An enclosed outdoor terrace is part of the additional pavilions added into the design. Photos: CH&I Architecture

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a price, and that includes warmer surroundings and a lack of greenery.

wn how a bit of creativity can cool the building down, as well as promote



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storey building that sits on a 794sq m site.

Refurbished for a family of five, the current design retains the overall form of the previous building, to minimise reconstruction work, while introducing new pavilions to meet the owner's needs.

“By keeping the demolition work to a bare minimum, we have also reduced construction waste,” said lead architect Michael Ching in an email interview.

These additional pavilions – consisting of a party hall, study room, gym and an enclosed outdoor terrace – are separated from the main building by a linear skylight.



The design of the Hydroponic House retains the overall form of the previous building to minimise reconstruction work, while introducing new pavilions to meet the owner's needs.

The first floor is divided into two wings, with a significant area dedicated to the children in the form of study rooms, a pantry and a family play area. The additional space created by the pavilion also extends the size of the master bedroom.

“Ample daylight enters the house by the positioning of the central courtyard and multiple linear skylights which illuminate the deeper sections of the house. Except for the store room, there is no dark corner in the house,” explained Ching. The courtyard sits between the new and old sections of the house. Each area in the main building is separated by openings, which increase the volume of space and offer a view of the surroundings. The openings and courtyard also create an ideal scenario for cross-ventilation.

#### Green features



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The highlight of the house is its hydroponic wall – 22.47m long and 3.9m high – the key feature that distinguishes the new pavilions' façade.

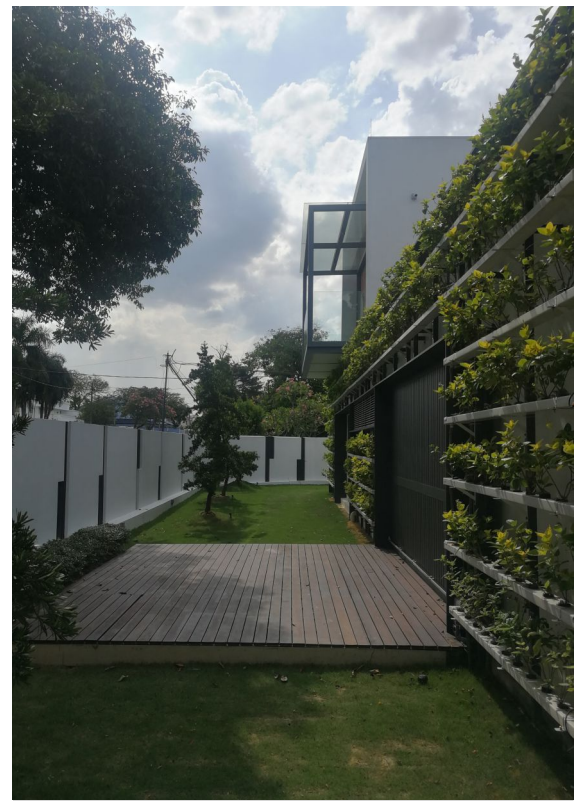
Besides buffering the house against external elements such as noise, and ensuring privacy, the wall also increases the growing footprint by 60sq m. This supports the family's intention to be self-sustainable and also provides space for decorative plants. Currently, there are about 400 plants sitting along the wall, offering a soothing view.

“The hydroponic wall creates a micro-climatic pocket. A majority of the day-use rooms have been positioned along this elevation to capitalise on the cooler ambient temperature,” said Ching. (A micro-climate is a set of atmospheric conditions that differ from those in the surrounding areas.)

Larger openings there boost cross-ventilation from this pocket through the entire building.

In order to reduce water usage, a dedicated rainwater harvesting system is used for irrigation. PV (photovoltaic) panels are also installed at the house to generate solar energy, reducing electricity consumption.

“Through the Hydroponic House, we wish to demonstrate that by incorporating greenery and other design features into the architecture, we can showcase how passive design is the key component of a sustainable house,” said Ching.



The hydroponic wall is the key feature that distinguishes the new pavilions' façade.



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The main entrance features smooth, exposed brickwork and a timber slat roof with low-e (energy-efficient) glass.

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