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Terrace with a large opening to obtain maximum natural lighting

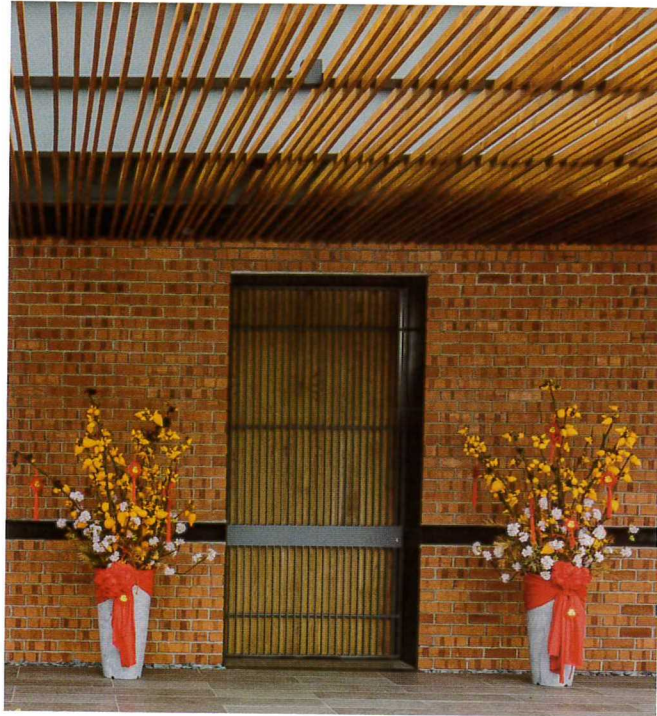
HYDROPONIC HOUSE

Hydroponic House is a two-storey bungalow refurbishment, with a new pavilion being introduced to reframe the overall spatial composition. Aside from comfortable living spaces for all family members, the owners wanted a decorative feature that help them to be self-sustainable. A hydroponic wall was chosen for this purpose, as well as to buffer the house from the external elements.

The wall was installed for the entire length of the dominant elevation to create a microclimatic pocket. Majority of the day-usage rooms were positioned along this elevation to capitalise on the cooler ambient temperature. Larger openings have allowed for cross ventilation—from this pocket through the entire building.

THE PAVILLION & THE SKYLIGHTS

The additional footprint created by the pavilions extends the dimension of the master bedroom. Each space is separated



The main entrance



The hydroponic wall

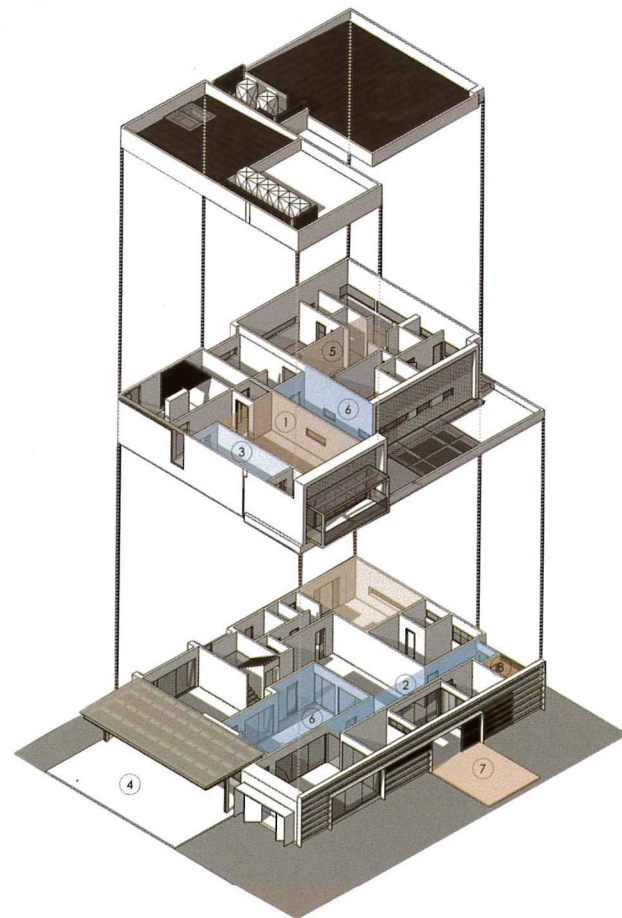
by permeable openings that allow the spread of its function physically and visually into the surrounding spaces. This gives flexibility to the owner to host multiple activities.

The first floor is split into two wings with the substantial area being dedicated to create study rooms, a pantry and a family play area. The pavilion houses a party hall, a gym and an enclosed outdoor terrace. These are separated from the existing main building by a linear skylight, which indicates a new circulation axis of the house. A central courtyard was also created between the new and old structure to enhance the effects.

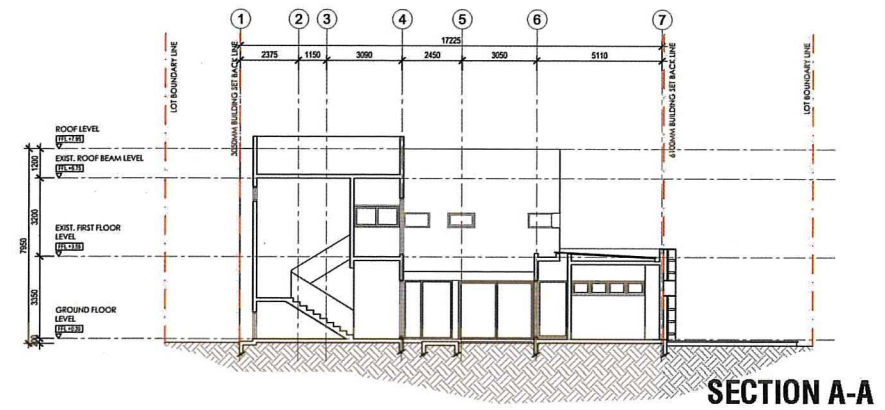
The original main building's ceiling was low so a sloping ceiling profile was adopted to maximise the height of the new structure. The house fit-outs were used to conceal the existing structural elements—a method to reconfigure the old design into the new programme.

SUSTAINABILITY & MATERIALS

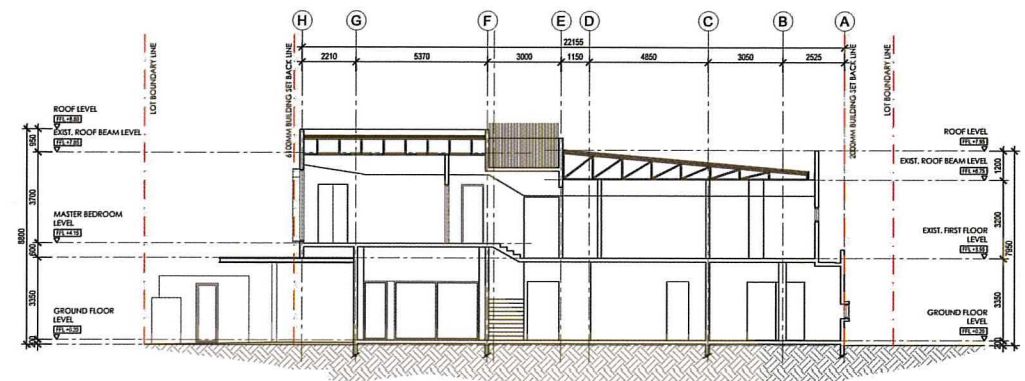
Ample daylighting is achieved by the positioning of the central courtyard and the skylights that illuminate the deeper section of the house. Solar panels were installed to reduce the reliance on electricity and rainwater harvesting was fitted into structure to irrigate the vegetable gardens. The majority of the building materials was sourced locally. Several of the materials were selected for their sustainable features, such as cork flooring, Forest Stewardship Council (FSC) certified timber flooring, and low volatile organic compounds (VOC) paints. All fit-outs are formaldehyde-free furniture. **C**



The axonometric diagram

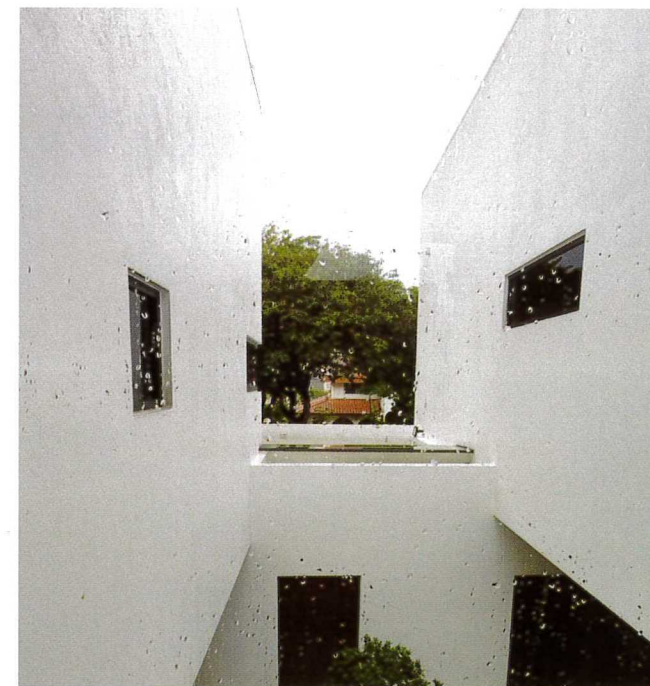


SECTION A-A



SECTION B-B

The house plan



The courtyard

PROJECT DATA

Project Name
Hydroponic House

Location
SS3, Taman University,
Kelana Jaya, Malaysia

Completion Date
30 December 2019

Site Area
793.86 square metres

Gross Floor Area
637.78 square metres

Building Height
2 storeys; 8.8 metres

Number of Rooms
8

Architecture Firm
CH&I Architecture Sdn Bhd

Principal Architect
Michael CH Ching; Steven Tung

Interior Design Firm
CH&I Architecture Sdn Bhd

Principal Designer
Michael CH Ching; Steven Tung

Civil & Structural Engineer
Pakatan Cergas Sdn Bhd

Mechanical & Electrical Engineer
Coburg Consulting Sdn Bhd

Quantity Surveyor
Perunding Kos Bersatu
Sdn Bhd

Lighting Consultant
Prominent Pros PLT

Green Building Consultant
Bgreen Consultancy Sdn Bhd

Main Contractor
Idaman Asal Sdn Bhd

Interior Fit-Out Contractor
Perabut Makmur Sdn Bhd

Images
CH&I Architecture Sdn Bhd