The double studwork structure allows the house twice the amount of insulation, maximising thermal efficiency

PURPOSEFUL POWER

A passive solar home that approaches sustainability with innovation and finesse

WORDS ALEXANDRA LONGSTAFF

PHOTOGRAPHY EMMA CROSS PHOTOGRAPHER

The study is a perfect example of useable circulation space, where an area that would have been under-utilised becomes highly functional

This home is a sustainability aficionado's dream. Every corner and crevice of the space is used efficiently and effectively to create a smooth-functioning, effortless abode that balances all the elements beautifully beneath its pitched perfection.

This plot of land — relatively flat — runs on an east-west axis. Prior to the build, there was just a dilapidated weatherboard residence that — while perhaps a little uninspiring — was useful in providing some materials that could be salvaged and reused for the shed and landscaping. It was just the first of many incredibly well-thought-out sustainability-driven elements to this build.

Its energy-efficient prowess can be found integrated into every element of this home. Of utmost importance was the desire for a passive solar system that would enable the space to maintain optimal temperatures with as little energy usage as possible. The first step towards this was brought to fruition via the positioning and shape of the design. "The main design challenge was to design a building that had plenty of solar to all spaces, even those to the south," explains Shae Parker McCashen, director of Green Sheep Collective. "This was achieved by creating two raking roof forms that slope down towards the south and soar high to the north, which protects solar access of the neighbour and allows north light into both east-west running forms, including all habitable spaces."

These raking ceilings give the home its edge. They allow for beautiful clerestory windows that filter light into the interiors and maximise on northern solar gain, enabling a stack-effect ventilation to all the spaces. "The play of light and shadow against the surfaces and shapes within create interesting and fun spaces that are a delight to inhabit," muses Shae.

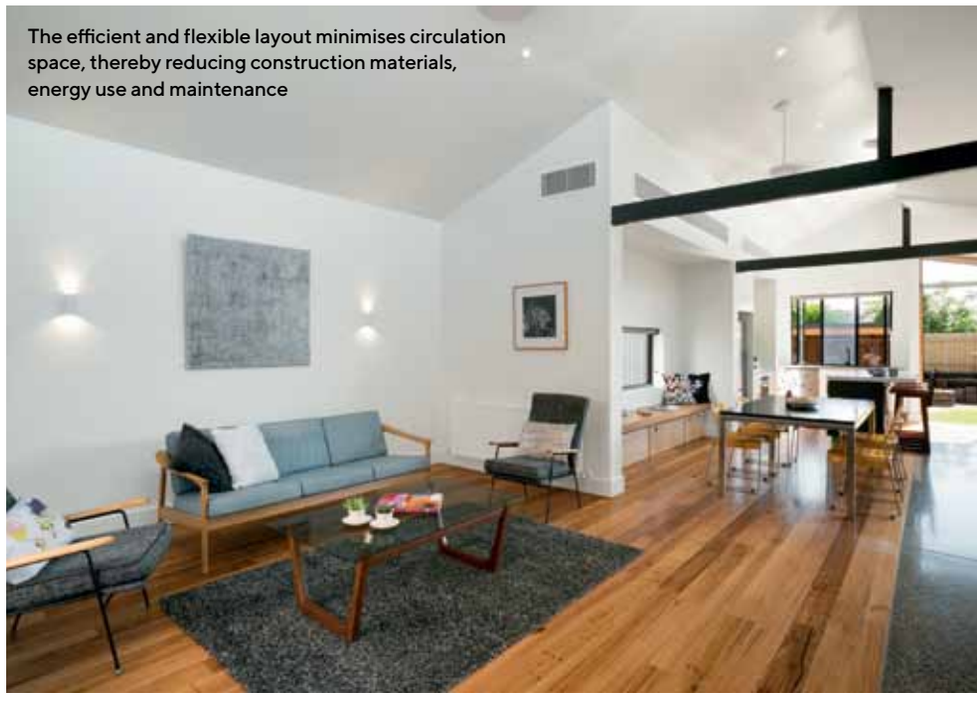
And this connection to light doesn't stop at the clerestory windows. Look a little lower and you'll find that the connection to the outdoors achieved via glasswork through the entirety of

Light filters into the home from the north, enabling stack-effect ventilation to all the spaces

DETAILS

HOUSE Northcote Solar Home
LOCATION Northcote, VIC
DATE COMMENCED November 2012
DATE COMPLETED 2015

"THE MAIN DESIGN CHALLENGE WAS TO DESIGN A BUILDING THAT HAD PLENTY OF SOLAR TO ALL SPACES" – SHAE PARKER MCCASHEN, DIRECTOR, GREEN SHEEP COLLECTIVE



The efficient and flexible layout minimises circulation space, thereby reducing construction materials, energy use and maintenance

East-to-west pavilions are connected via courtyards and open spaces, allowing for a sense of privacy as well as a sense of togetherness

the home takes the natural light and ventilation aspects to the next level.

This was of utmost importance to this build. The brief was in fact to "provide a comfortable, sustainable, passive solar home that allows for a flexible, changing family life. Spaces were to be creative, flexible and fun, with views to the sky, garden, and access to north light. Indoor/outdoor living was very important to the client with the ability to move from one space to another with ease," explains Shae. "The elongated floor plan with central courtyards enables every room to have a connection to outdoor space, while providing natural light and ventilation."

This was achieved by creating three pavilions all running side-by-side, east to west that are all connected via a central corridor and feature courtyards. Every space in the home receives natural light from the north and all the courtyards seamlessly merge the spaces together, providing an element of privacy while still facilitating a form of togetherness.

The sustainable elements of the design continue to thread through the space via other means, too. "The double studwork structure allowed the house twice the amount of insulation, maximising thermal efficiency and creating a stable, comfortable and quiet home," explains Shae. "The efficient and flexible layout minimises circulation space, thereby reducing construction materials, energy use and maintenance. Sustainable materials specification and the inclusion of rainwater tanks further minimise the building's environmental footprint. Passive heating and cooling is further assisted by strategically positioned thermal mass, a high level of insulation, and low-e double-glazing with appropriate eaves, which stop unwanted sun in summer and allow winter sunlight to penetrate deep into the house." Add to that the inclusion of lightweight

Inside, the pitched roof offers an architectural feature

OF UTMOST IMPORTANCE WAS THE DESIRE FOR A PASSIVE SOLAR SYSTEM THAT WOULD ENABLE THE SPACE TO MAINTAIN OPTIMAL TEMPERATURES WITH AS LITTLE ENERGY USAGE AS POSSIBLE

materials and cladding that can be easily maintained and reused, and you've got a stunningly environmentally low-impact home.

This house is smart in its sustainable inclusions as well. Budgetary constraints meant this family of four needed to be innovative in their approach. They did this by giving priority to the environmental elements that couldn't be altered or added at a later stage, including the form, layout, orientation, double stud walls and high-spec windows, but any renewable energy systems that could be retrofitted later were placed on the backburner for a time when funds could be allocated.

And let's not pass over the aesthetic elements of this build, either. Material juxtaposition via warm timber, cool polished concrete, patterned tile, raw exposed steel beams and recurring colour splashes bring a level of extra sophistication that culminates in excellence.

The result is a beautifully considered abode that ticks all the boxes and creates a magical living experience for its inhabitants. One that will last for years to come, both for this family and those in future years.

PROJECT TEAM

ARCHITECT Green Sheep Collective, greensheepcollective.com.au
BUILDER Elyte Focus, elytefocus.com.au
INTERIOR DESIGNER Green Sheep Collective, greensheepcollective.com.au

"THE ELONGATED FLOOR PLAN WITH CENTRAL COURTYARDS ENABLES EVERY ROOM TO HAVE A CONNECTION TO OUTDOOR SPACE, WHILE PROVIDING NATURAL LIGHT AND VENTILATION" – SHAE PARKER MCCASHEN, DIRECTOR, GREEN SHEEP COLLECTIVE

FITTINGS & FIXTURES

Concrete floor Hy-Tec Industries
Frames & trusses Tate Timber and Hardware
Roofing & accessories Metroll Preston
Cladding Radial Timbers & Metroll Preston
Windows Rylock
Water tank Roofing Options Centre
Plaster, insulation & waterproofing CSR
Doors Corinthian
Carpet Feltex/Western Distributors
Timber flooring Tait Timber and Hardware
Lighting M Elec