

the GREEN LIVING magazine

ISSUE 11



GET READY FOR The Green Living Show 2013

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- * Healthy Homes - Ecobuild, Cleantech, Ethical Business
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Successful EDA Conference 2012 in Hamilton

KEEPING YOUR COOL, THE *environmental way!*



Keep the windows open and keep an open mind to the abundance of free resources available to us.

Environmental design is as much about designing for optimised sun angles and sustainable materials as it is designing for optimised seasonal wind directions and natural air flow. Summer is on the horizon in New Zealand with a hint of spring in the air, the same air that could keep us ‘cool’ and comfortable over summer.

For people thinking of building or renovating considering local seasonal wind flow is a good starting point to assist in the environmental design strategy for summer time. New Zealand has a South West prevailing winter wind direction which typically comes up from the Antarctic. The intensity of the wind will depend on how elevated a site is and if it’s close to the West Coast, tucked away in the Central lands or, elevated on the Eastern coast. Prevailing summer winds come in from the Pacific Ocean in a North to North East direction and are generally a lot warmer (most of the time). East coast houses will receive direct exposure to these winds and are also where a lot of us spend our summer break. You might notice when at the Bach this summer during evening time people like to socialise at the back of the house which is sheltered from the North East winds.

‘Cross ventilation’ is the simplest form of natural cooling available to us. This entails understanding what direction the winds will come from at a particular time during the year and allowing for the maximisation of this air flow or in some cases we might want to shield the house from cold South Westerly winds. There has to be a considered strategy with how the wind will enter and exit the house. In essence we are trying to create a natural air current through the house powered by prevailing winds. During summer

this might include positioning operable windows on the North East elevation located at a lower level to bring in cool ground air, as the air enters and moves through the house it is heated and begins to rise. Having operable mid-level or high level windows on the South elevation will allow this air to escape which in turn creates a natural cross flow of air movement through the house keeping you ‘cool’.

“cross ventilation is the simplest form of **natural cooling** available to us”

My personal favourite cooling strategy is ‘Stack Affect’. It’s been around for thousands of years and is made even better through the use of smart technologies which can monitor internal temperatures and mechanically open high windows to exhaust hot air when needed. ‘Stack Affect’ works on the principle that external cool air is located at ground level and will be pulled into a house as warm air heats, rises and exits. This in turn creates a continuous movement of natural ventilation with constant cycles of fresh air entering and exiting the house. The motion can be likened to a set of lungs which breathe for the house providing fresh clean oxygen to the occupants. Apart from the health benefits of fresh air and added comfort there is also the ‘very cool’ factor of knowing your house is directly engaging with its natural environment by utilising a very natural principle of hot air rising. We can also use ‘Stack Affect’ to trickle ventilate the building over winter by having windows

slightly open. This option works best with a passive solar house which has an abundance of naturally 'Conducted' heat over winter.

I have included two case studies in this article to give some ideas of how architects go about designing for air flow.

off the ground for maximised site air flow, large verandas preventing direct sunlight from entering the houses and the use of traditional timbers reduce solar gain (compared to concrete). The project was designed by Solarei in association with Jutharat Thatprakob who is a local Thai Architect.

So whatever you do this summer, keep your cool, keep the windows open and keep an open mind to the abundance of free resources available to us at all times. ■



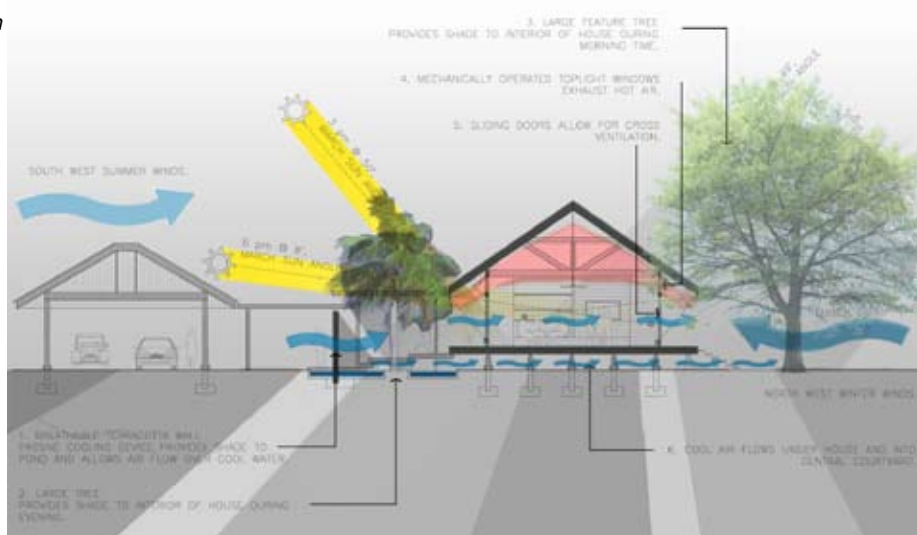
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Above: Okaihau College Perspective Section

One is located in Northland, Okaihau College. This design considers the re-use of an existing 1950's building with the integration of passive cooling (Stack Affect) and passive heating strategies. This building would otherwise be a non-environmentally responsive building with limited natural light, coldness and limited air circulation. Not a very nice learning environment for the younger people of this country. The project was designed by Solarei in association with MOAI architects.

The second design is located in Thailand in a province called Kanchanaburi, summer temperatures soar up to 40-45 degrees. Seasonal wind paths cross ventilation and air flow were the primary influences for the building layout. The design draws upon a traditional vernacular architecture, with the villas elevated



Below: Kanchanaburi Climate Section

