Sustainably inspired designs

During the years Buck Architects + Associates has accumulated a portfolio of homes designed to be self-sustaining in their ability to maintain comfortable and healthy internal climates.

Teear House

Founder Roger Buck feels that designing and constructing buildings today has become far more complex than it was only a decade or two ago.

Buck Architects + Associates specialises as a practice in areas related to energy efficiency. So it is critically important for Roger Buck and his team that not only do its buildings perform as intended in all the usual ways, but they are constructed to very high standards in terms of the ways in which they collect, conserve and use energy.

"This means, in terms of energy for example, avoiding heat loss through uncontrolled air leakage and thermal bridging, which can result from the use of substandard products and poor construction practices. It follows that high performance buildings must include high performance window systems," Roger says.

He says that in order to cope with this we are dependent upon good advice and support from manufacturers, suppliers, installers and a range of technical specialists working within, but also outside, the industry.

"If the finished result is to meet expectations then product dependability and workmanship go hand in hand," he explains.

"A part of this stems from a need to satisfy the regulatory part of the process, but a larger part in my view comes from the fact that simple, basic, cottage building has had its day and we should now look at buildings as being potentially resource-hungry objects which can have significant economic and environmental impacts.

"Looked at like this, it will be clear that the industry should be working hard to minimise these impacts. We are also very conscious of taking durability seriously by designing for long lives coupled with very low ongoing maintenance."

Roger feels that in terms of weather resistance this is of the utmost importance in terms of durability and health, and for walls we may use several levels together, depending on the type of underlying structure. These could take the form of, "An external water resistant finish such as plaster, a cavity for drainage and behind this an underlying waterproof layer. For roofs and the associated flashings we commonly use Butynol, often with a standing seam appearance if the roof is visible."

With all of these critical factors in mind it is vitally important that we have available to us contractors, subcontractors and suppliers who consistently perform well, he says, and who can be relied upon to go beyond the strict limits of any contractual relationships, should issues arise, whether these are at the design stage, while construction is underway, or subsequently.

"Our aim as designers is to achieve the best possible outcomes for our clients and it follows that the quality of the workmanship and the products used on any project is critical to its success.

"In our experience the following companies associated with the featured houses have performed exceptionally well in all regards. NK Windows have been involved with us seemingly forever as both suppliers and installers.

"Ardex are well established and widely respected within the industry; they provide tried and tested products in which we have confidence and the installers they use have performed well for us. And Sto Plaster Systems are relatively recent arrivals, but are now regularly specified by us for both interior and exterior plaster finishes; the feedback we get from clients amply justifies their selection."

Roger Buck explains how the following houses all adhere to energy efficient design. They are all constructed to a very high standard in terms of the ways in which they collect, conserve and use energy.

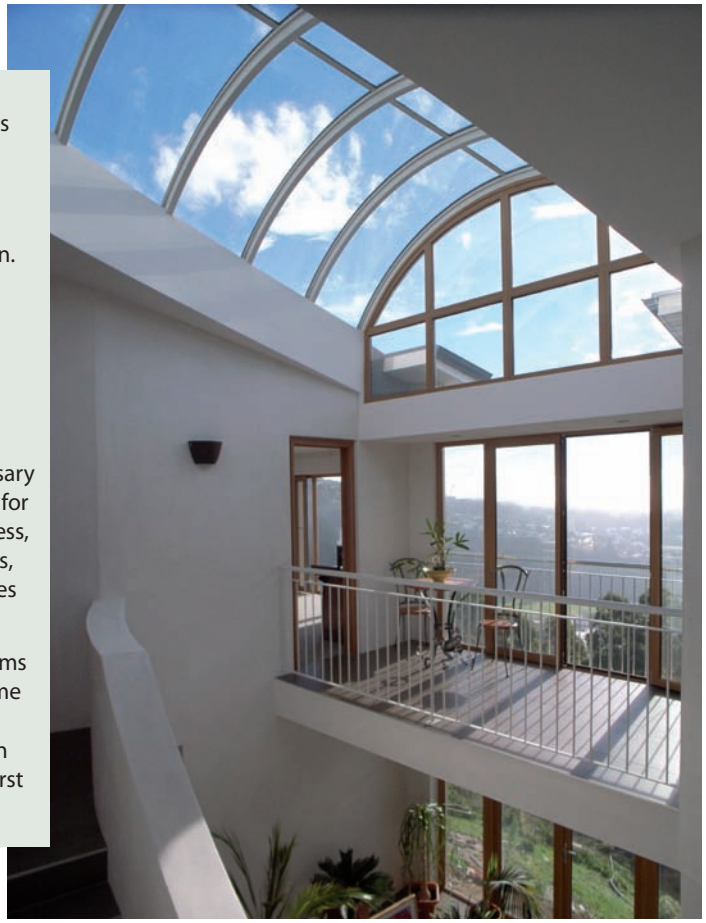
TEEAR HOUSE

The Teear house in Clifton is north facing, has suburb views and is the latest addition to a community development.

"It has extremely high levels of thermal mass and insulation. The result is that in the two winters since its completion each has only required a total of fourteen hours of space heating," Roger says.

"The internal planning is intended to provide all necessary accommodation on one level for the owners, including car access, with space for kids and visitors, along with an office and games area downstairs.

"The glazed atrium, which forms part of the entrance, will in time be filled with exotic planting rising through both levels – an amazing sight especially for first time visitors."



WHITTY HOUSE

The Whitty house is on an elevated site in Halswell. It has beautiful views across a small lake and a distinctly rural feel to it while being surprisingly close to the city.

"These views of course took priority when designing the house, with the understanding that solar gain would be to some extent compromised as a result.

"All the main functional amenities, including vehicle access, are available to the owners on one level. This means that it is a place where an entire lifetime can be enjoyed without compromise

and is also one where extended families can live together comfortably.

"As with the Teear house it includes all of the design characteristics in terms thermal mass and insulation and therefore has similar levels of thermal stability, quietness and comfort."

TAYLOR HOUSE

The Taylor house situated in Geraldine is in a totally rural location with the owners strongly drawn to sustainable living. It is currently a minimal first stage of what is expected to become, in time, a larger development. The views are roughly north east to south west over an undulating landscape, with a backdrop of mountains.

"This first stage is not ideally orientated and to deal with this a transpired solar collector has been installed on the north wall. The air heated by this device is circulated within the building by a solar electric (PV) driven fan, with ducting distributing it to the parts of the house which receive the least solar gain.

"A further uncommon feature is the use of a 'green roof'. This blends the house into the landscape and minimises its visual impact. The wastewater system is biologically purified and the result is used for irrigation."

Taylor house in Geraldine

JACKSON HOUSE

The northerly orientation of this house in Wanaka coincides with the stunning mountain views. It was designed to reflect its rural context by using timber and local stone cladding and to give every room views and sunshine. A garage at the rear of the main house has a small self contained apartment for visitors built above it.

"The main house has two bedroom areas separated by the living spaces, with the latter having a small conservatory to give a sunny sitting area, especially on clear, but cool winter days and also to help heat the house. Other supplementary space heating comes from a solid fuel space heater and some areas of electric under-tile resistance heating.

"This house differs from the other houses by having a timber roof instead of concrete, so there is a less thermal mass and it uses locally made double glazed timber window frames instead of PVC." Roger says.

"To reflect the rugged alpine location a mix of timber and local stone cladding has been used as external wall cladding, along with a dark grey, non-reflective membrane roof covering. The internal walls are plastered block work."

Roger Buck
Registered Architect
Buck Architects + Associates
T (03) 3666 888
E info@buckarchitects.co.nz
www.buckarchitects.co.nz