MARRYING AFFORDABILITY WITH SUSTAINABILITY

Affordability and sustainability are two hot topics in the building industry. We look at one designer who is passionate about combining them, designing affordable, sustainable houses.

By Des Molloy, Contract Technical Writer, Golden Bay

Mark Fielding is the principal of small Nelson home design consultancy Ecotect Ltd (www.ecotect.co.nz), so named to reflect a commitment to only undertake commissions that are green enough for Mark's own peace of mind.

Mark says his work isn't about architecture, it's about home design. He often feels that his is a lone voice trying to marry affordability with sustainability. Aware that all new construction is using some of the planet's finite resources, he feels a responsibility to not be wasteful with those resources.

Design is only sustainable if it's affordable

A product's carbon footprint is always a consideration when building up his design and its specification. Mark doesn't see designs as being sustainable unless they are affordable. Designing expensive green mansions for the elite is not a field he puts his tent up in.

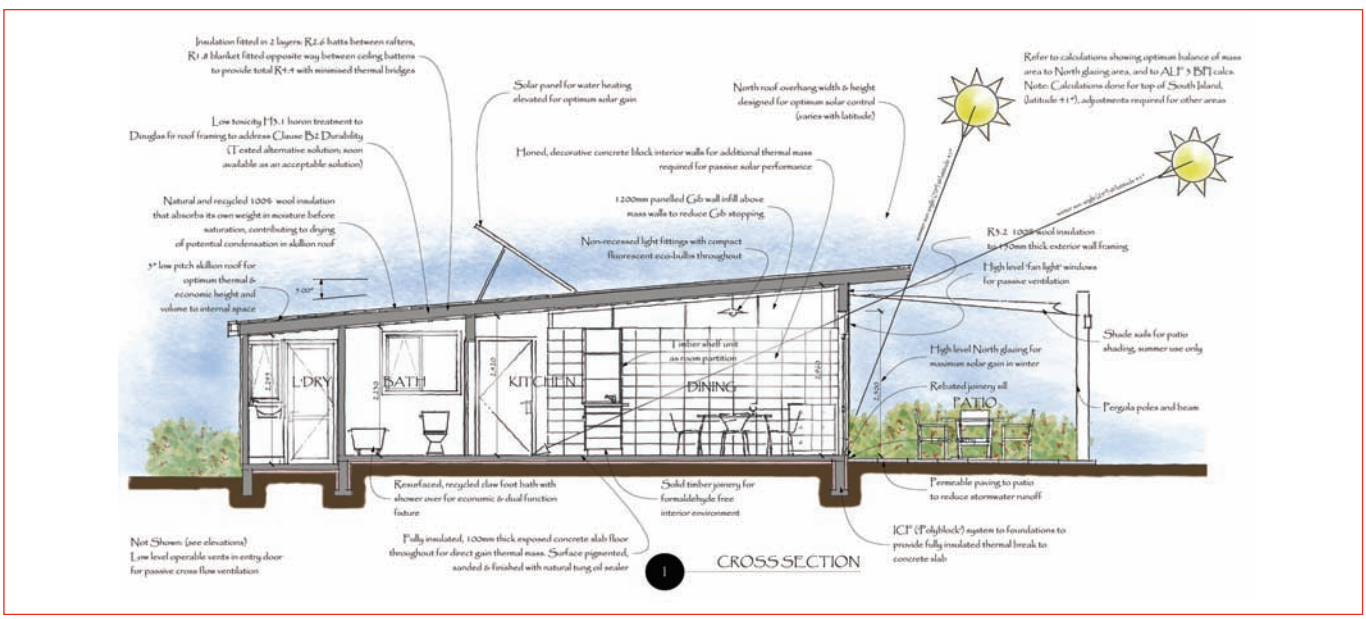
Following this commitment to affordability, he has put a lot of effort into developing a range of homes. His affordability philosophies incorporate trying to use suitable local materials or those with a recycled content, where possible. House designs maximise what you can get for nothing, like the comfort gained from good passive solar design.

Mark credits the old Ministry of Energy publication *Design for the sun* by Dave Brewer (Pacific Energy Designs Ltd, 1984) as providing a watershed for him. He still uses it as an important reference. He also cites BRANZ's Level web pages (www.level.org.nz) and often refers his clients to them.

Keeping it simple

Simple design is a key part of the appeal of his houses. There is always a balance to be found between performance and cost, and Mark is a strong believer that you shouldn't just do something because you can afford to. You need to consider the bigger picture.

For instance, generally, he will avoid costly hydronic heating systems, preferring to use direct sunshine irradiating thermal mass as the primary source of heating. He will then specify only a small efficient wood burner or a marble radiant heater to complement the passive heating he has incorporated. Even when specifying a marble radiant heater, Mark looks to the planet's affordability by only asking for a particular model that is manufactured adjacent to the source of the marble – again, minimising the carbon footprint.



View of an Ecotect design for an affordable and sustainable house.

Cheaper = smaller and better

Another simple yet effective aspect of his houses is the lack of 'dead' passage space. Bedrooms are accessed directly from the north-facing, sunny living spaces. Something so simple makes the overall layout more efficient and helps with the common client quandary of affordability. It's an easy solution – 'if you want your house cheaper ... make it smaller and smarter'.

Locally sourced adobe blocks are used as a thermal mass. These adobe internal feature walls release the stored warmth of the sun, regulate humidity and have wonderful acoustic properties. Mark has successfully used both solid adobe internal walls and adobe veneer walls (150 mm thick adobe blocks fixed to a timber frame). A correctly positioned veneer wall (along with an exposed concrete slab floor) will store enough of the sun's heat to release warmth for a day or so, and this is now his current choice as a good balance of performance and affordability.

Passive solar design can be tricky

Fully understanding passive solar design and being able to match this with clients' needs is key to achieving a successful result. Usually, his houses will be sited and designed so the sun reaches far into the main living areas during the winter months, but this can have the irritating downside of producing glare and overheating the space, unless moderated with judiciously placed sunscreen blinds and careful ventilation.

Thermal mass can also work in reverse if incorrectly designed – instead of radiating warmth, it can draw heat from occupants. The right balance of mass area and north window area must be calculated for optimum performance.Thermal mass can work for you in the winter and summer if you understand it and use it to your advantage.

Affordability and sustainability can go together

In a recent winter visit to a just completed house in Golden Bay, it was observed that the living area temperature had varied from 17–24°C in the previous 24-hour period. That was with no heating, curtains yet to be fitted and with the thermal masses (concrete floor and adobe walls) not yet fully dry or operating at optimum efficiency. The temperature under a temporary mat and the open floor area was also compared. Under the mat, it was cold, whilst the exposed sealed concrete floor was warm to the touch.

Although Mark says aesthetics are not the main consideration when developing his designs, the simplicity he achieves belies balance and style. It seems affordability and sustainability can go together after all.

A recently completed house in Golden Bay.

Locally sourced adobe blocks and concrete floors are used as a thermal mass. A small efficient wood burner complements this passive heating.