MODERN GREEN HOMES

Sanctuary

ISSUE
65

Cool design for hot climes; tips for FireWise gardens; Australia's best bushfire zone builds; Accoya eco-timber

Tropical delights

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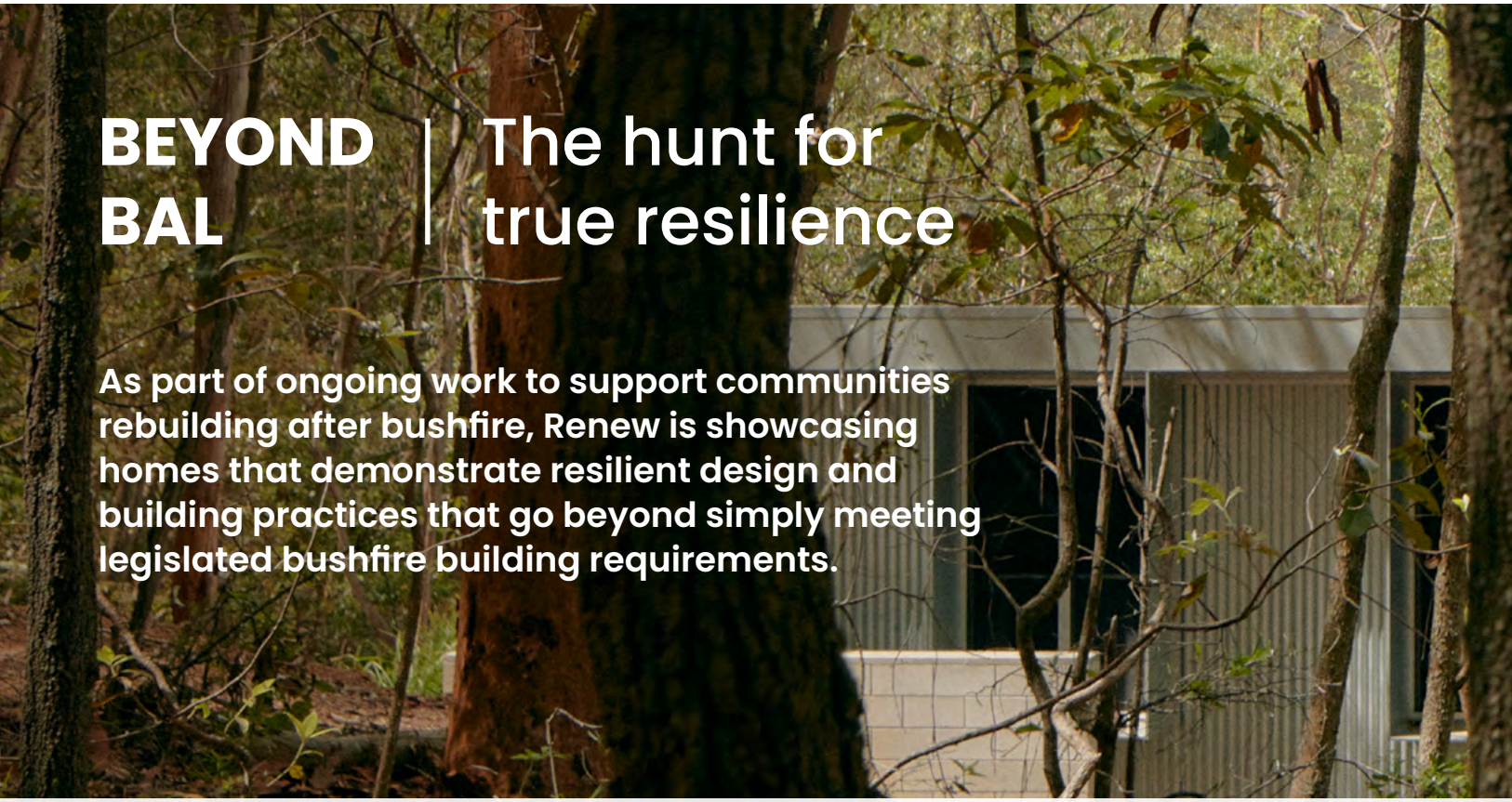
Below Designed by Nielsen Jenkins, the Mt Coot-tha House in Brisbane addresses the BAL-40 rating of its sloped, treed site by making use of robust non-combustible building materials. Image: Tom Ross



BEYOND BAL | The hunt for true resilience

As part of ongoing work to support communities rebuilding after bushfire, Renew is showcasing homes that demonstrate resilient design and building practices that go beyond simply meeting legislated bushfire building requirements.

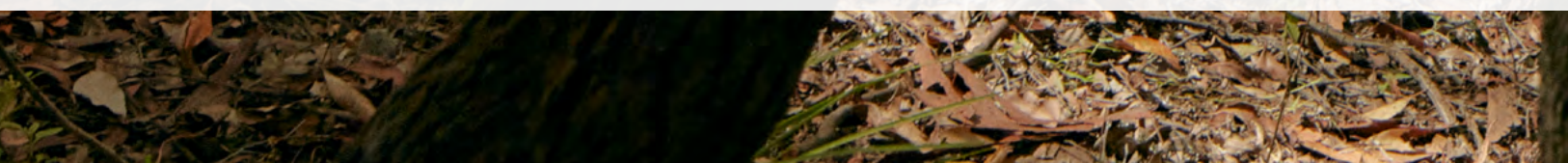
Back in 2020, Renew developed the Green Rebuild Toolkit in response to the mega-fires that had swept across large areas of Australia the previous summer, in order to help people rebuild their homes and increase resilience in the face of future climate disasters. This year, with extreme summers back on the weather radar, the Toolkit has been expanded to include 12 case studies of bushfire-resilient homes around the country.

These homes are the pick of the bunch identified as part of our Beyond BAL project. We searched for the most fire-resilient buildings in Australia, with a view to extending our understanding of best practice beyond the somewhat complicated and variable Bushfire Attack Level (BAL) rating system, which is written into national and state building regulations but tends to be applied inconsistently.

Renew invited architects, designers and homeowners to submit designs, and worked with bushfire design experts Dr Douglas Brown from Bushfire Architecture and Nigel Bell from ECOdesign Architects to assess the submissions based on three criteria: affordability, environmental sustainability and bushfire resilience. “The intent was to seek out innovative homes and share the best of them for all to learn from,” says Nigel.

The Beyond BAL project found differences between states and territories in the application and stringency of bushfire building requirements. The accepted level of training and expertise amongst bushfire assessors varies. In addition, the starting point for assessment, the Fire Danger Index (FDI), is based on past fire history rather than projections taking climate change into account, and is artificially low in some states. Hence, BAL assessments are not uniform across the country. However, as an indication of what’s likely to develop, Tasmania and the ACT are now prohibiting new houses being built on sites assessed as higher risk than BAL-29.

People building in bushfire-prone areas are often doing so because they value the lifestyle of living among the gum trees, and are willing to take on some increased risk of bushfire loss rather than clearing vegetation. This typically puts their sites into high or extreme BALs (BAL-40 to BAL-FZ) where the risk is from burning embers, radiant heat and direct flame contact, as well as extreme winds and smoke. All the Beyond BAL submissions grappled in some way with these issues: balancing retaining the natural bushland ecology (with its associated risk to property and even life) with creating a safer building (and associated elevated building costs). Some projects included extensive land clearing, while other homeowners chose to retain



the bushland. Most accepted a regulatory compromise. What is clear from Beyond BAL is that there is no single, simple way to address the requirements of the infinitely varied building sites across the nation; a regulatory response to appropriate asset protection zones is complicated.

As our climate heats and bushfire risk increases, insurance becomes unaffordable or unavailable, and bushfire building requirements become more stringent, it will become more expensive and more difficult to meet national, state and local regulations. One intent of the Beyond BAL project was to find and showcase lower-budget homes that still meet these challenges. "As a result, some beautiful homes set on steep slopes within eucalypt forest were not shortlisted because of their very high build costs, although they otherwise had a lot to recommend them," explains Nigel. Many of the projects selected for case studies are small houses with simple yet striking designs and robust, readily available materials, which may need to be the way forward in bushfire-prone areas.

All 12 case studies will be available on the Green Rebuild Toolkit website at greenrebuildtoolkit.com; read on for a taster of three of our favourites.

THE THREE MAIN CRITERIA FOR BEYOND BAL PROJECTS:

- **Bushfire resilience:** considering enormous variations across ecologies and sites.
- **Environmental sustainability:** such as energy efficiency and materials used, essential in mitigating further extreme climate events.
- **Affordability:** noting that meeting the regulatory requirements for high BAL-rated sites invariably adds complexity and cost to building or renovating.

BROAD BUSHFIRE RESILIENCE CRITERIA FOR ASSESSING SUBMISSIONS:

- Defendable siting
- Landscape setting
- Water supplies
- Building design
- External construction materials
- Windows and doors
- Verandahs and decks
- Innovation

Lowlands Residence

The owners of Lowlands Residence were keen to bring their 1950s beach shack back to useful life. On a low hill surrounded by peppermint trees and shrubland, the house has just one gravel access road, and they were rightly concerned about a potential bushfire impacting their property and personal safety. “Over 90 per cent of Western Australia is designated as bushfire-prone, and many parts of the Great Southern and South West regions face a significant risk of fire,” says architect Sarah Moir of H+H Architects.

Sarah was asked to design a bushfire-resilient solution that could work around the original shack: to create a durable ‘shell’ that would allow for a ‘lock and leave’, low-maintenance holiday home, with flexible indoor/outdoor spaces. “The clients weren't aiming to create an architectural marvel, but a functional solution with an agricultural aesthetic,” Sarah says. “The original building had a lot of character but was very flammable and rundown.”

Being closely surrounded by vegetation, the shack was originally deemed BAL-FZ. A 27-metre asset protection zone was cleared around the house to reduce the fuel load, and the rating was lowered to BAL-40. Locally sourced gabion rock walls and gravelled areas were constructed around the building to create a non-flammable buffer.

With building function and protection the focus, the shack was reclad and enveloped with a new verandah featuring BAL-40 rated perforated bushfire shutters. The shutters create a flexible space that can be either completely open to the elements or enclosed and secure. They protect against vermin, insects and embers, and are a practical solution to maintain the cottage but achieve BAL compliance. “If it weren’t for the shutters, we would have needed to make the entire inner shell compliant with BAL-40 requirements,” Sarah explains.

The shack was reclad with Colorbond, fibre cement sheeting and Easylap panels. The new deck is of HardieDeck fibre cement boards with a clear finish. To enhance the connection between old and new, the original windows and doors were reused internally, helping draw light into the central spaces. Timber from the original house was repurposed for kitchen cabinets and benchtops. The floorboards were lifted, sanded and relaid, and bathroom and laundry fixtures reused. Wool insulation was installed to ceiling, walls and underfloor, and new high-performance double-glazed windows were installed.

DESIGNER
Sarah Moir, H+H Architects

LOCATION
Great Southern WA
(Noongar Country)

BUSHFIRE ATTACK LEVEL
BAL-40

SIZE
House 127m²
Land 12.3 hectares

COST
$400,000 (2018)

PHOTOGRAPHY
Lee Griffith Photography