

Sanctuary

MODERN GREEN HOMES

ISSUE
71

Flexible floor plans, student studios, shared projects and multigenerational living; knockdown-rebuild timber salvage and reuse; ideas for permeable paving and more

OFF *the* PLAN

Creatively different
approaches to housing

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WIN

A furniture and interior
design package from Moss
Furniture, valued at \$6,000

Offer open to Australian residents. Details page 79



AT A GLANCE

- Owner-designed small house built with hempcrete
- Gas-free, 8.5-Star home with low running costs
- The beginnings of a co-living community



HOUSE PROFILE
Castlemaine, VIC

WORDS
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PHOTOGRAPHY
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The life **bespoke**

Bree's small-footprint hempcrete house in Castlemaine, Victoria, is designed for liveability and community.



Above Flooded with northern light, Bree's compact home features a concrete slab floor, exposed beams of reclaimed Oregon, and a raked ceiling that accommodates a bedroom and a mezzanine flexible-use space. **Right** Curved dividing walls offer privacy and visual interest in the bathroom.





When Bree McKilligan's close friend Rachel came to her and said, 'I've bought this land, and I'd love a community of women living around me – would you like to join me?', Bree jumped at the opportunity. She had been planning a sustainable build for a long time. "I got the idea back in 2014 that I would like to live in the country, somewhere that I could afford to buy land and build. And I wanted a sustainable house," she says.

The gift of co-ownership in the small town of Castlemaine in Victoria's Goldfields region allowed her to start planning the build in earnest, as well as begin to shape the co-living community she had dreamt of. "I'm all into unconventional living and bespoke living design," she says, "designing places for the people who will live there."

Bree initially contracted an architect who lived locally, but when he relocated to Gippsland, she realised that she wanted to design the house herself. Wanting "something that felt European", she settled on a Spanish barn-style design and,

after doing a hempcrete workshop with Joe D'Alo, owner of the Hemp Building Company, she was sold on the material and contracted Joe to build the house. "Hempcrete is a one-stop wall system and it's got amazing qualities. Hemp is a sustainable crop that uses much less water than other grain crops, and captures significant carbon dioxide as it grows. It's also fire retardant and breathable," she explains.

Joe liked the design, finalised with the help of draftsman Dean Rayner. The ground level features a bedroom, a combined bathroom/laundry, and an open kitchen, living and dining area opening onto a north-facing terrace with shade pergola. "It's quite different," Joe says. "But while it's a small house, the structural engineering is complex. I probably didn't give enough thought to that to start with."

Nevertheless, for a builder operating in a strictly controlled regulatory environment, hempcrete has advantages over other natural building techniques

such as strawbale or rammed earth. "With hempcrete, a lot of the concerns that building surveyors can have are removed because it uses a standard timber frame construction," explains Joe. "The frame is the skeleton, and the hempcrete is the body mass around it. This makes it easy for engineers to assess, too."

The house has a raked roof that rises to meet a 6.8-metre-high west-facing wall with private views of a gully and creek; a second bedroom and a small flexible-use space are tucked up under the high end of the roof. The height of the wall proved a challenge for Joe when he came to install the scaffolding and formwork that holds the hempcrete in place until it sets. "We didn't have much room between the house and where the land starts to drop away," he says.

Bree loves the raked roof. "I think it gives dynamism to the place, especially in a small house that with a flatter roof could have ended up looking like a little cottage," she says. "It was expensive though! Joe said that with the amount



Above Bree isn't afraid of a bit of colour!

of hempcrete he used because of the wall height, he could have built a three-bedroom single-storey house. But I don't regret it." The finished build is modest in size at 110 square metres of floor space, and came in at 8.5 Stars for energy efficiency. To reduce expenses, Bree sourced all of the systems and fixtures for the house herself, and she and friends did all the painting and finishes – including to the concrete floor – over two winters.

Bree has used reclaimed and secondhand materials and furniture throughout. "I like the little quirky details. It makes it very personal," she says. "I guess what I love most about it is that I designed it for me and how I live, and that's an amazing privilege." She fell so in love with the design process that she

is now enrolled in an Advanced Diploma of Building Design at Bendigo Kangan Institute. She will design a third small house on the property for another friend, once they navigate the subdivision process to allow each homeowner to have their own title.

For Joe, the biggest win is the liveability of Bree's house. "You hear a lot of stories about how good hempcrete's performance is, but it's not just the thermal qualities," he says. "It's also the peace and quiet, and the health aspects of the building: the plant bio-composite walls are vapour-permeable, helping regulate internal temperature and humidity. It's hard to describe that feeling of internal comfort. It's the quality of the lived experience of the space." **S**



LEGEND

- 1 Entry
- 2 Bedroom
- 3 Living
- 4 Kitchen
- 5 Dining
- 6 Bathroom
- 7 Laundry
- 8 Stairs
- 9 Flexible-use space
- 10 Secret door to bedroom
- 11 Balcony
- 12 Deck with bath
- 13 Pergola
- 14 Enclosed outdoor sunroom
- 15 Heat pumps and tank
- 16 Void

SPECIFICATIONS

DESIGNER

Bree McKilligan,
Design Green Studio

DRAFTSPERSON

Dean Rayner,
Design Draft Build

BUILDER

Joe D'Alo,
The Hemp Building Company

PROJECT TYPE

New build

LOCATION

Castlemaine, VIC
(Dja Dja Wurrung Country)

COST

\$720,000, completed 2024

SIZE

House 110m²
Land 2,403m² (co-owned
with friend)

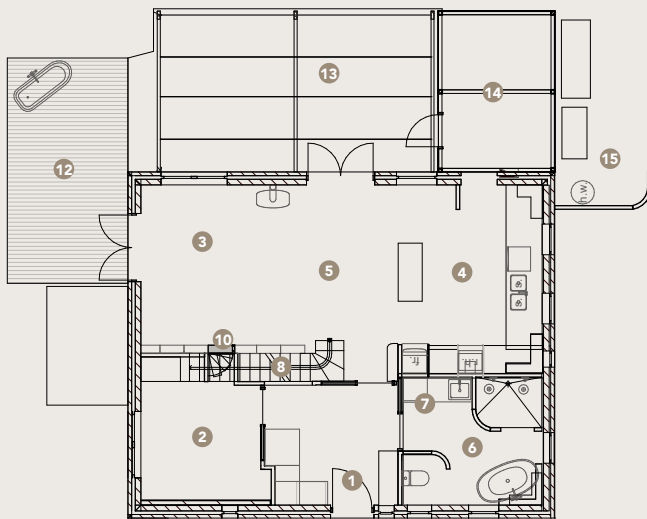
ENERGY RATING

8.5 Stars

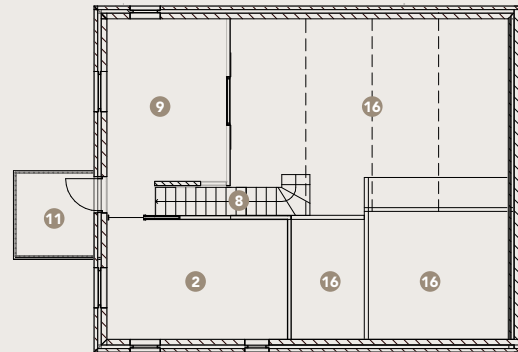
ENERGY ASSESSOR

Kirsty Gunn, Ecomission

GROUND FLOOR PLAN



UPPER FLOOR PLAN



HOT WATER

- Reclaim CO2 315L heat pump

RENEWABLE ENERGY

- 6.6kW solar PV system from Central Spark, Castlemaine
- Grid-connected with capability for future battery connection

WATER SAVING

- Kingspan 11,000L rainwater tank plumbed to whole house, with town water backup
- Filtration system from Statewide Irrigation
- Water-efficient tapware

PASSIVE DESIGN, HEATING & COOLING

- Hempcrete construction and insulated concrete slab for a high-performing thermal envelope
- North orientation for optimal passive solar gain in winter
- Pergola with deciduous grapevines for summer shade
- Powder-coated aluminium window and door shrouds for shading, custom made by builder
- Secondhand cedar shutters to eastern windows
- Window and door placement designed for good cross and stack ventilation

ACTIVE HEATING, COOLING & VENTILATION

- Stiebel Eltron heat pump hydronic heating to ground level slab and two wall panels upstairs
- Secondhand Nectre 15 wood heater – installed but not yet needed
- Wiring in place in living area for ceiling fan or reverse-cycle air conditioner if needed

BUILDING MATERIALS

- Timber-framed, infill hempcrete walls using hemp grown in Victoria
- Colorbond roof in Surf Mist for solar reflectivity
- Concrete slab floor
- Insulation: Bradfold Gold High Performance batts to ceiling (R7), Anticon roof blanket to roof (R1.8), hempcrete external walls (R4.2), Bradford Soundscreen batts to internal walls and upper level floor (R2.5), 60mm Perimeter XPS insulation under slab (R1.82)
- Reclaimed Oregon feature roof beams from The Salvage Yard, Castlemaine
- Reclaimed timber for upper level floorboards, joinery, pergola and decking
- Secondhand Corian kitchen bench with integrated sinks

WINDOWS & GLAZING

- Double-glazed windows and doors with FSC-certified Victorian ash frames, from High Craft Windows

LIGHTING

- LED lighting throughout, some using secondhand fixtures

COOKING

- Bosch 60cm induction cooktop
- Secondhand Miele oven

PAINTS, FINISHES & FLOOR COVERINGS

- Natural hydraulic lime (NHL) plaster to hempcrete walls
- Haymes, Dulux and Porters Paints low-VOC paints to ceilings, plasterboard walls and some joinery
- Porters Paints Concrete Wash and Sealer to concrete floor
- Haymes Woodcare UVEX Finish to window and door frames

OTHER ESD FEATURES

- Small-footprint house and efficient floor plan with flexible-use mezzanine
- Australian-made fixtures used where possible to reduce transport emissions
- Most furniture secondhand, some reupholstered locally by FMB Upholstery to extend its life