At home with hemp

LOCATION Chewton, VIC • **WORDS** Sasha Shtargot • **PHOTOGRAPHY** Leon Schoots & Shayne Hill

At a glance

- Striking hempcrete home with recycled timber and rusting steel cladding
- Unrendered internal hempcrete feature wall reflects the homeowners' creativity
- All-electric, energy efficient home with little need for active heating or cooling

Image: Shayne Hill

Opening for
Sustainable House Day
Sunday 15 September 2019

For more information visit sustainablehouseday.com and search for 'Chewton Hemp House'

This family home in central Victoria makes the most of the beauty and thermal properties of hempcrete, to satisfying effect.

When Brenna Jensen and Dominic Crinson's house build was underway, prominently positioned on the main road through the hamlet of Chewton near Castlemaine in central Victoria, passing motorists would often stop and wander over, keen to know more about what they were doing.

What was the building material that was being busily mixed, tamped and used to create the walls of the house? Was it rammed earth? "Once or twice we had people who came past and recognised that it was hemp," Brenna says, "and they were so delighted."

The signature feature of the Chewton Hemp House, as the couple have called their project, was a work of love for them and their three small sons, friends and other volunteers who built the hempcrete walls over nine months in 2018. The project was a collaboration between the owners and fledgling local design-build business House Workshop, with local cabinetmaker and artist Mark Anstey designing and building the kids' bedroom and kitchen cabinetry.

Facing sweeping bushland at the rear, Brenna and Dominic's house has a strong presence and sits comfortably in its environment thanks to the unrendered hempcrete walls and weathering steel cladding that echoes the colour of the red ironbark trees that are prominent on the site.

Inside, a short corridor leads to the children's room, which has a plywood mezzanine where the couple's sons sleep. Cupboards for toys are cleverly built into the stairs on either side of the room. There's a tiled bathroom for the children and a laundry on this side of the house.

Walking in the other direction you are greeted by a stunning hempcrete wall enhanced by wavy coloured oxide patterns from the layering process of its creation and the inclusion of earth and other materials in the mixture. The wall acts as a divider, hiding a quiet office space for Dominic away from the hustle of the living room and kitchen. A playful opening in the wall accommodates a feature leadlight window; in another opening around the corner, facing the expansive open plan living and kitchen area, a rack of textile yarn can be swivelled around to reveal a screen for entertainment. A fireplace is set

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In the centre of the beautiful hempcrete feature wall, a display of yarn spools pivots to allow the screen behind it to be viewed from either the living room or the study, tucked on the other side of the wall.
Image: Leon Schoots

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The parquet floor in the kitchen was made using salvaged timber offcuts. Deciduous vines will eventually cover the pergola outside for summer shade.
Image: Leon Schoots

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The children's room features twin staircases against each side wall leading to a sleeping loft above the play space; storage is tucked underneath. The concrete slab floor was burnished and oiled with natural oils. Image: Leon Schoots

in a third aperture.

The wall defines the internal space and expresses the couple's livelihoods – Dominic is an artist and Brenna is a textile designer who started a children's organic merino wool clothing business – as well as their playful creativity. But there's much more in this part of the house: the north-facing living area is filled with light thanks to clerestory windows and double-glazed hardwood sliding doors that open to views of the bush. Beyond the kitchen is the main bedroom with an ensuite and walk-in robe.

As well as a desire to be actively involved in the design and build of their dream home, the house is defined by the couple's strong values of environmental sustainability. Hempcrete, a hemp and lime mixture, was chosen as the building material, Dominic explains, because of its strong insulative properties, thermal inertia and ability to regulate internal humidity. "Hemp acts as a carbon sink, absorbing carbon as it grows," he says. "It's the best plant you can grow for reducing carbon in the environment. And the finished building will absorb significant amounts of carbon over the next two decades."

The home is all-electric, with highly efficient appliances including an induction cooktop and hot water heat pump. For a family of five, Dominic says their energy bills have been very low since moving into the house in December 2018. There's been little use of the fireplace – despite the notably cold weather of a central Victorian winter – thanks to the home's passive thermal properties, bulk insulation in the ceiling and extensive double glazing.

Water saving comes in the way of a 22,500-litre corrugated steel rainwater tank which is plumbed to feed the house and garden. When the tank is approaching empty, the family switches to town water. There's also an extensive greywater system that includes swales and reed beds allowing the watering of the family's newly planted orchard.

The couple have incorporated an ethic of salvage and reuse in the building of their home: the wooden cladding at the back of the house used to be part of an old squash court; the feature leadlight window and a quirky 19th century toilet cistern in the ensuite were from a secondhand sale; and in the kitchen the rangehood and sink have a few little bumps and bends that tell of being factory seconds.

Brenna and Dominic always had the idea that they wanted to build their own home and are justifiably proud of their achievement – in particular the hempcrete walls that are the stars of the build – but

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"A good hempcrete wall will be lightly tamped in the centre, and firming up the inner and outer faces helps strengthen the wall," says homeowner Dominic. "The elimination of thermal bridging through the continuous form of the hemp contributes to a well-insulated building." Image: Shayne Hill

they are quick to acknowledge the key role of the House Workshop team. "We had a good relationship with them," Brenna says. "They let us do a lot of things ourselves."

It was an important project for House Workshop, too – only their second build. "We are trying to make beautiful, healthy, energy-efficient homes available to more people," says co-director Raphael Read. "Hempcrete is a superb material; the challenge is making the build process faster and more efficient. That's why working with Dom and Brenna has been so great; it has introduced us to hempcrete and added another feather to our cap." S

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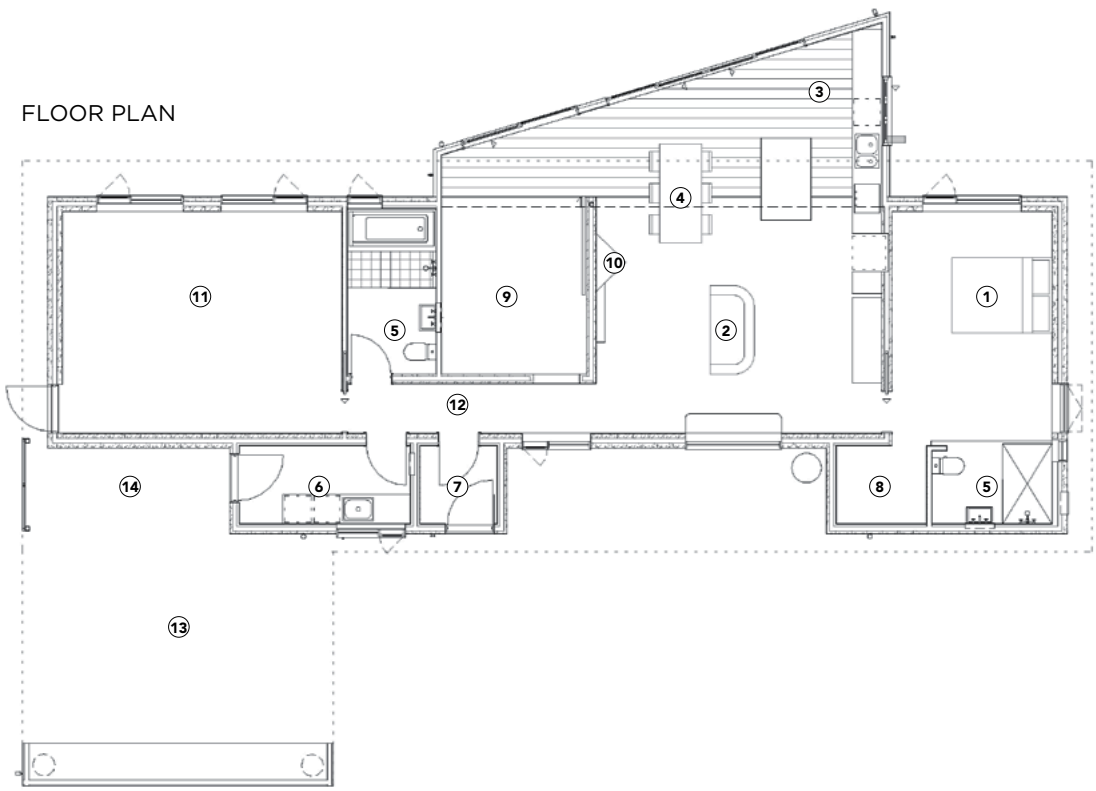
Image: Leon Schoots

FLOOR PLAN



LEGEND

① Bedroom
② Living
③ Kitchen
④ Dining
⑤ Bathroom
⑥ Laundry
⑦ Entry
⑧ Walk-in robe
⑨ Office
⑩ Fireplace
⑪ Kids' room with sleeping loft above
⑫ Hallway
⑬ Carport
⑭ Workshop

HOUSE SPECIFICATIONS

HOT WATER
- Sanden Eco Plus 250L heat pump

RENEWABLE ENERGY
- Wiring installed for planned 4kW solar PV system with 4.8kWh battery

WATER SAVING
- 22,000L Aquaplate corrugated steel tank for house & garden (switched to town water when empty)
- Reed bed greywater treatment system with outflow irrigating orchard

PASSIVE DESIGN, HEATING & COOLING
- Hempcrete used as primary building material: a mix of hemp and lime which insulates and also provides some thermal mass
- House orientated north for maximum winter solar gain and with concrete slab for thermal mass
- Pergola covered in deciduous climbers on north to mitigate summer solar gain
- Natural cross ventilation paths and openable clerestory windows designed for effective night purging of heat in summer

ACTIVE HEATING & COOLING
- Mercator ceiling fans in main rooms

BUILDING MATERIALS
- Hempcrete and timber frame external walls
- Cladding: HW350 1.6mm rusting steel and recycled spotted gum floorboards
- Internal walls: bare hempcrete, coloured lime-rendered hempcrete and standard timber frame with plasterboard
- Zincalume roof
- Burnished and oiled concrete slab floor
- Insulation: two layers of R3.5 Earthwool batts to ceiling; R1.3 Anticon blanket to roof; R2.7 Earthwool to external timber frame walls; R2.5 Earthwool to internal walls to bathrooms

WINDOWS & GLAZING
- Argon-filled double-glazed Victorian ash windows and doors with blackbutt sills, built and installed by Custom Timber Windows and Doors

LIGHTING
- LED pendants and downlights

PAINTS, FINISHES & FLOOR COVERINGS
- Hempcrete exterior sealed with sodium silicate
- Render to interior hempcrete walls: lime and sand mix
- Interior plasterboard walls: Annie Sloane chalk paint
- Eco Colour ceiling paint and wall primer
- Concrete slab: Livos Linus and Kunos oils
- Parquet flooring made using timber offcuts
- Door and window frames: Livos Alis decking oil
- Tadelakt render to ensuite walls and shower: Moroccan Render from Rockcote
- Bathroom and laundry ceramic tiles designed by Dominic Crinson

OTHER ESD FEATURES
- All-electric house with induction cooking
- Beehives and food-producing gardens
- Owners' car runs on waste vegetable oil

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Image: Leon Schoots

DESIGNER
Collaboration between owners and House Workshop

BUILDER
House Workshop

PROJECT TYPE
New build

LOCATION
Chewton, VIC

COST
$450,000

SIZE
House 160m^2
Land 2000m^2

ENERGY RATING
Officially 6.6 Stars; higher in reality (see Insights below)

ENERGY RATER
Lewin Consulting

INSIGHTS
"After the design was officially rated, we significantly increased the amount of insulation. Also, there isn't a formal R-value for hempcrete walls as it depends on how tightly the material is packed, so a default figure was used in the energy rating calculations. We're confident that the house as built performs far better than 6.6 Stars."

Dominic Crinson
Homeowner