

Designer spotlight Tracy Graham, Connected Design

Builder: Nick Sowden, Sowden Building Solutions. Photographer: Sam McAdams-Cooper

How did hemp building materials first come to your attention?

I was first introduced to hempcrete when builder Nick Sowden suggested it after reading about it in Japan. He was curious and with research and interest in all its properties our client of the first Marrickville hempcrete house said yes.

What about the materials captured your interest?

I was interested because it ticked so many boxes that I was needing in a wall system - insulation, natural materials, a solution to avoid condensation risk in walls, reduce the risk of mould (client had asthma) low embodied energy, agricultural crop and as a wall sequesters carbon from the atmosphere. It is also a monolithic system which means significantly less thermal bridges in the wall. Simple construction method with fewer materials.

I find designing & working with hempcrete answers so many of my concerns in particular how to avoid the use of plastics in construction, thermal performance, acoustics and vapour permeability.

It's challenging when using standard building construction because walls have so many layers of materials that include gypsum, insulation and vapour permeable membranes. The insulation is also only between the studs so there is a small amount of thermal bridging at the gaps.

A hempcrete wall is simply the hemp mixture and then later the render or if you choose you can batten and add any sort of cladding you prefer. The monolithic wall then achieves good insulation and is vapour permeable. The result is a space that has great acoustic performance. I also love the smell and the warmth with the texture of the wall.

Hemp Construction: Carbon, Sustainable Development Goals, and the value of local materials

By Winton Evers, Eco Profit

As the world accelerates toward net zero, the building sector is under increasing pressure to reduce its carbon footprint. Construction materials alone account for a significant share of global greenhouse gas emissions. Yet one material stands out for its ability to not only cut emissions but actively store carbon: industrial hemp.

Hempcrete and other hemp-based construction products absorb and lock away carbon dioxide throughout their life cycle. From cultivation to finished wall or product, hemp provides a natural form of carbon sequestration, in many cases providing extended permanence over trees and other carbon storage options.

This directly advances Sustainable Development Goal (SDG) 13 (Climate Action) while also contributing to SDG 11 (Sustainable Cities and Communities) by enabling healthier, low-carbon housing, and SDG 12 (Responsible Consumption and Production) through renewable, regenerative material use.

Beyond its environmental benefits, hemp construction reduces reliance on imported materials. Australia currently imports a large portion of traditional construction products such as cement, steel, and insulation, materials with high embodied emissions due to energy-intensive production and international shipping. By developing a local hemp supply chain, we keep value and create jobs within regional communities, enhance supply security, and eliminate the significant emissions associated with long-distance freight.

Hemp also aligns with circular economy principles. Hemp stalks can be grown in rotation with food crops, improving soil health and biodiversity, then processed into building materials that remain carbon-negative (i.e. positive net removal). At end-of-life, hemp products can be recycled or returned to the earth, closing the loop, an example of the ultimate circular economy.

The shift toward hemp construction is more than an innovation, it is a pathway to achieving the Sustainable

Development Goals while building homes and communities that are healthier, more resilient, and truly sustainable.

By choosing locally grown and manufactured hemp building products, we invest in a future where carbon reduction, social good, and economic opportunity go hand in hand.

Building with steel frames

Nic Jouin, Permastructure

Overall, my experience building with a steel frame and hempcrete has been a bit challenging. Steel frames aren't really designed for hempcrete, and their sharp, hollow edges and corners make it tricky to pour. We also had to deal with corrosion issues from the lime, which meant coating all the frames in bitumen emulsion — a long and labour-intensive process that took several days and a lot of hands.



Steel frame build by Nic Jouin, Permastructure

In addition, once the building is finished, the steel frame tends to move quite a bit thermally. We've noticed more movement at the corners of the building, which can lead to cracking in the hemp because of the expansion and contraction between hot and cold days.

From this experience, I think a better approach would be to use a hybrid method — combining Porter-Frames with larger steel members for the main structure, and using timber frames as infills between these larger members. This would allow for more stability, make hemp placement easier, and reduce both movement and corrosion issues.



Tracy Graham, Connected Design

What is the feedback you've had from your clients since the project was completed about the performance of the home?

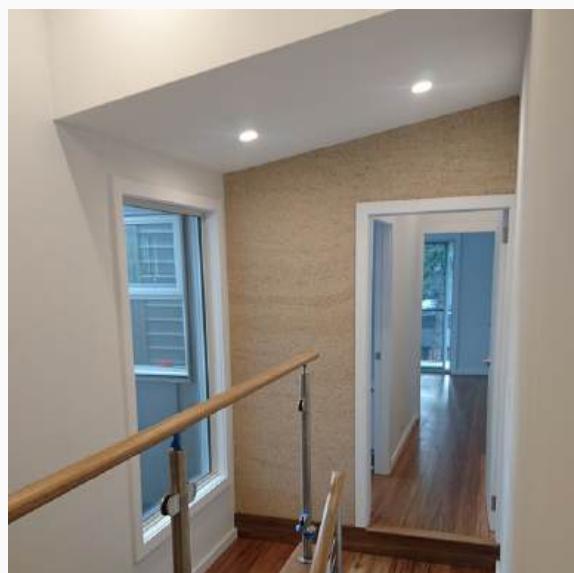
The clients love the look and feel of the hempcrete walls. I can comment with our own renovation that the walls have also impacted the sound of the space. We love the texture and depth. Our own first floor addition we leave the window open in the bedroom all year round and have not found it as cold as the house was before we renovated. On really hot days we will close the windows, shut the blinds and run the air con for an hour. It leaves the room cool for hours after the air con is turned off.

In choosing to design a building with hemp, were other objectives such as encouraging carbon farming, increasing regional development or local employment a consideration?

It was definitely important to know that the hemp was grown in Dungog, 220km away, and it was supporting farming and that it was an agricultural product that had benefits to both land, farmer and environment.

In your opinion how much can designers influence the achievement of national emissions targets?

They can educate and talk with their clients to make sure that when the builder suggests a change of materials that they know why they have specified these. It's really important to have everyone on board understanding why the product has been selected.



Built by Sowden Building Solutions. Photographer: Sam McAdams-Cooper

Building tip: Installing around Lintels

Klara Marosszky

The lintels around the openings in a hemp masonry build are essential structurally, but create a few challenges when you're installing hemp. If your lintels are LVLs we recommend that these are coated with a 50% bondcrete solution beforehand because LVLs are very dry and will draw a lot of moisture from the hemp.

The lintels are also thicker timbers that divide the hemp in two regardless, so we need to manage any risk of delamination by ensuring that the hemp is well keyed in.

There are a number of ways that this can be approached. One method used in natural building is to put a lot of screws into the lintel. These can be really sharp on your hands. Some good alternatives are to use products like

bar-chairs or insulation fasteners and to attach and pack in around these.



Bar-chairs installed by Hannan Build. Photographer Tara Jones

Thank you to all the builders, architects, designers and clients that worked with us over the last 12 months.

We wish you a peaceful and happy festive season!



