

# How a 3D printer could build your next home

A giant 3D printer has built a pool cabana on the outskirts of Melbourne in a rare feat that could pave the way for 3D-printed houses in the future.

The printing technology used a special type of concrete to construct the building as part of the reality renovation TV show *The Block*. It was among the first 3D-printed builds in Australia.



The 3D printer in action, building a pool cabana. Photo: David Cook/Channel Nine

Nick Holden, chief executive of Contour 3D, the company that designed the printing technology and used it on the show, said 3D printers had come a long way in Australia in the past few years.

The technology is so good it can now print a structure such as a pool cabana in a matter of hours, as seen on the show. *The Block* airs on Nine, owner of *The Sydney Morning Herald* and *The Age*.

Hopes are high the printing technology could be used to build houses in the future.

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This would cut the cost of building, as 3D printing is 20 to 30 per cent more cost-effective than using traditional methods, Holden said. The time taken to build a house could be reduced from months to weeks.

Holden said when the company goes into mass production, people would be able to build more environmentally friendly, long-lasting homes because the concrete is designed to have a 100-year life span.

“The typical house lasts 50 years before major maintenance is needed and people usually rip them down and start again,” Holden said.

The concrete mix used in the printing process was designed with the help of academics at the University of NSW, using 30 per cent recycled material.



The pool cabana on The Block was built via 3D-printing technology. Photo: David Cook/Channel Nine

University of NSW senior lecturer at the school of civil engineering Ali Kashani said the pool cabana is the first on-site 3D-printed building in Australia. He said 3D printing is used in the building industry for some pre-fabricated elements which are assembled on site but its use is not mainstream.

He and PhD student Hamid Bayat worked closely with Holden for more than 12 months to develop the special concrete that could stand in place while drying and meet building standards.

“We’re still working on the mix, optimising the material and looking at the sustainability of it,” Kashani said.

“And making sure that it passes the construction code.”



The 3D printer can create curved walls. Photo: David Cook/Channel Nine

The team hopes eventually to develop a concrete mix that will use up to 70 per cent recycled material and will be self-insulating, so additional insulation will not be needed.

They also hope to introduce artificial intelligence to the printer, which could change the concrete mix used depending on the weather, or for day and night printing when temperatures change.

Kashani, who studied 3D concrete printers used in other countries including the United States, said the technology allowed the cabana to be built quickly and cheaply.

The pool cabana’s curves would normally take more time and money to build, he said.



The Block's Scott Cam and Nick Holden on set. Photo: David Cook/Channel Nine

There was tension on the show's set as the printer, with gantries and robotics technology, had not been tested on such a large project.

“So if we made a mistake, it was certainly going to end up in print [and on the air],” Holden said. “Even up to a couple of weeks before, we really didn't feel we were ready to go ... but it was an unbelievable result in the end ... it was nerve-wracking though.”

The 3D printer worked for 28 hours straight to print the pool cabana for host Scott Cam, who has his own project this year alongside the contestants.

In typical Melbourne style, the weather offered challenges, changing from sunny, to raining and even snowing during the build.

“The building industry is the last to be fully automated using tech such as robotics,” Holden said.

“The industry is still building pretty much the way it did 2000 or 3000 years ago.”

Despite the drama, Holden said there were many lessons learnt from *The Block* build and the company will in future build something lighter that can travel more easily across the country.

Their next project is printing a tiny house for clients in Gymea in Sydney's south.

The printer and its progress on the pool cabana was unveiled in Tuesday [13 Sept] night episode of *The Block*.