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**Bamboo road bridge can support a 16-tonne truck**
By Mason Inman

Bridges built from bamboo instead of steel could provide a cheaper, more environmentally sustainable engineering solution in China, a recent experiment suggests.

A novel type of bridge with horizontal beams made from a bamboo composite proved strong enough to support even heavy trucks in tests. The bamboo beams are cheaper and more environmentally friendly to make than steel or concrete, yet offer comparable structural strength.

Yan Xiao, [a professor] who works at the University of Southern California, in Los Angeles, US, and at Hunan University in China, led the development of the bamboo beams used to make the bridge.

Instead of using round, pole-like pieces of unprocessed bamboo, which have been used as building material for many thousands of years, he came up with a way of assembling timber-like beams from many smaller strips of bamboo.

Precise details on the process remain proprietary, but Xiao says the strips are cut from large stalks of bamboo, arranged in multiple layers, and bonded together with glue. The technique has never been used to build such large beams before, Xiao says.

## Sustainable Harvest

Last week workers finished assembling a 10-metre long bridge of Xiao's design in the village of Leiyang in Hunan province, southern China.

Using prefabricated beams, it took a team of eight workers just a week to assemble and did not require heavy construction equipment. It proved strong enough to carry a 16-tonne truck and, and based on structural testing of the bridge, should be able to support even more weight, Xiao says.

Pound-for-pound, bamboo is stronger than steel when stretched and more robust than concrete when compressed. Also, stalks several meters tall mature in just a few years, rather than a few decades as with trees, so more can be harvested from the same amount of land.

Furthermore, since it is a grass it can be harvested like mowing a lawn – leaving the root system intact so that the plant can regrow.

## Green Solution

Bamboo beams could work for bridges up to 30-metres long, Xiao says, making them suitable for carrying pedestrians in cities or cars on highway overpasses.

"I think very highly of the work that professor Xiao is doing," says architect Darrel DeBoer, who works with unusual building materials. "It's quite worthwhile to find alternatives to the concrete that we are using way too much of."

DeBoer notes that cement production releases a lot of the greenhouse gas carbon dioxide: 5-10% of global CO2, according to different estimates. This is an unavoidable part of the chemical process used to make cement from calcium carbonate.

Bamboo, on the other hand, soaks up CO2, as it grows. "From an environmental perspective, bamboo is a great choice," DeBoer says.