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# New Zealand's cardboard cathedral is earthquake proof

By Janet Fang | August 27, 2013, 8:02 PM PDT



After the cathedral in Christchurch, New Zealand, was badly damaged in a 2011 earthquake, it was replaced by — not the tallest or largest structure — but by “the world’s only cathedral made substantially of cardboard.”

The \$6 million cardboard cathedral was formally unveiled earlier this month. *New Scientist* reports.

The Transitional Cathedral is made from 98 giant cardboard tubes 600 mm in diameter and 20 meters long. As a building material, cardboard is readily available, recyclable, surprisingly strong, and consistently low-cost. But will it turn pulpy when wet?

No, according to the cathedral’s designer, Japanese architect [Shigeru Ban](#). The building is earthquake-proof, fireproof, and won’t get soggy in the rain.

The tubes are coated with three layers of waterproof polyurethane, protected by a polycarbonate roof and a solid concrete floor, and further supported by laminated veneer lumber inserted beams.

It’s designed to last 50 years. “Paper buildings cannot be destroyed by earthquakes,” said Ban, who’s been using cardboard since 1986 to design structures all over the world, ranging



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Cardboard and wood structures are naturally more earthquake-resistant: their flexibility offer more strength under tension, absorbing energy with collapse. Concrete, on the other hand, is heavier, so it's got more inertia and builds more momentum when shifted.

The new cathedral is made to withstand 1.2 g of lateral force — that's equivalent to an event that can be expected once in a thousand years.

[Cardboard Cathedral via New Scientist]

Images: Bridgit Anderson via Shigeru Ban Architects (top), ChristChurch Cathedral gallery (right)

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### About Janet Fang

Janet Fang is a contributing editor for SmartPlanet.

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