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NTU's new sports hall The Wave: 5 things to know about the mass engineered timber used to build it



The new NTU sports hall, called The Wave, is the first large-scale building in South-east Asia with a structure built completely using mass-engineered timber. ST PHOTO: ONG WEE JIN

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SINGAPORE - Instead of the usual concrete or steel structure commonly seen in Singapore's buildings, Nanyang Technological University's new sports hall was built using mass engineered timber.

Known as The Wave, the building features a 72m roof made of seven timber arches. It is the first large-scale building in South-east Asia built with the technology, and is one of four developments in Singapore that have adopted the timber construction method.

To produce mass engineered timber, layers of timber panels are glued together for strength and structural stability. Then, they are cut to specific dimensions in factories, before being shipped off for on-site assembly.

Here are five characteristics of mass engineered timber.

1. IT IS FIRE-RESISTANT

Mass engineered timber does not burn, instead it chars at a rate of 0.75mm per minute. As a result, the timber used to build the sports hall has an extra buffer layer of 50mm, which is "sacrificed" for charring in case of fire, allowing for an hour of evacuation.

The charred layer also acts as an insulation and protects the inner core from heating.

2. IT CAN BE PROTECTED AGAINST MOISTURE AND TERMITES

Structures made of mass engineered timber do not usually require special maintenance regime. The timber is treated against termites and will be checked yearly.



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3. IT IS SOURCED FROM SUSTAINABLE FORESTS

The timber is harvested from sustainably managed forests, which means new trees are planted to replace those that are harvested. Mature trees are also harvested to prevent them from decaying and emitting carbon into the atmosphere.

Mass engineered timber is recyclable and stores carbon for life, helping to mitigate climate change.

4. IT MAKES CONSTRUCTION FASTER AND EASIER

As the building process involves assembling prefabricated parts, it took 14 workers about three weeks to assemble the 72m wave-like roof of the sports hall.

On the other hand, a roof made of steel or concrete would likely take 30 workers and two to three months to construct, according to managing director Kang Choon Boon of B19 Technologies, the contractor for The Wave.

5. IT IS STRONGER THAN CONCRETE OR STEEL

Buildings with large roofs typically need columns or scaffoldings to support the weight. However, mass engineered timber is much stronger than concrete or steel in terms of weight-to-strength ratio. This means that the roof does not require any internal columns or pillars to support the weight of seven timber arches that are over 440 tonnes.

Instead, columns are designed to be on the exterior of the building, leaving a cavernous three-storey space.