TE WHARE NUI O TUTEATA

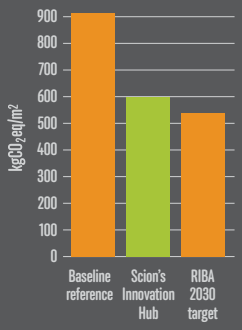
CO_2 + CO_2 = 0

Carbon-zero build

454 tonnes CO_2-eq stored in wood

459 tonnes CO_2-eq emitted during materials manufacturing and building construction

At 561 kg CO_2-eq/m², whole-of-life embodied carbon in the building is very close to the 2030 Royal Institute of British Architects (RIBA) target



Diagonal grid structures (diagrids) are an efficient way to provide strength and stiffness and require less material than traditional structures

418 tonnes of CO_2-eq stored in the structure of this building – equivalent to the emissions from 160 people taking return flights from Auckland to London

23

The timber in this building contains 550m³ of wood – equivalent to 23 logging trucks

22

The diagrid passed the test of 45 tonnes of downward pressure applied to it (the equivalent of 22 Hilux utes)

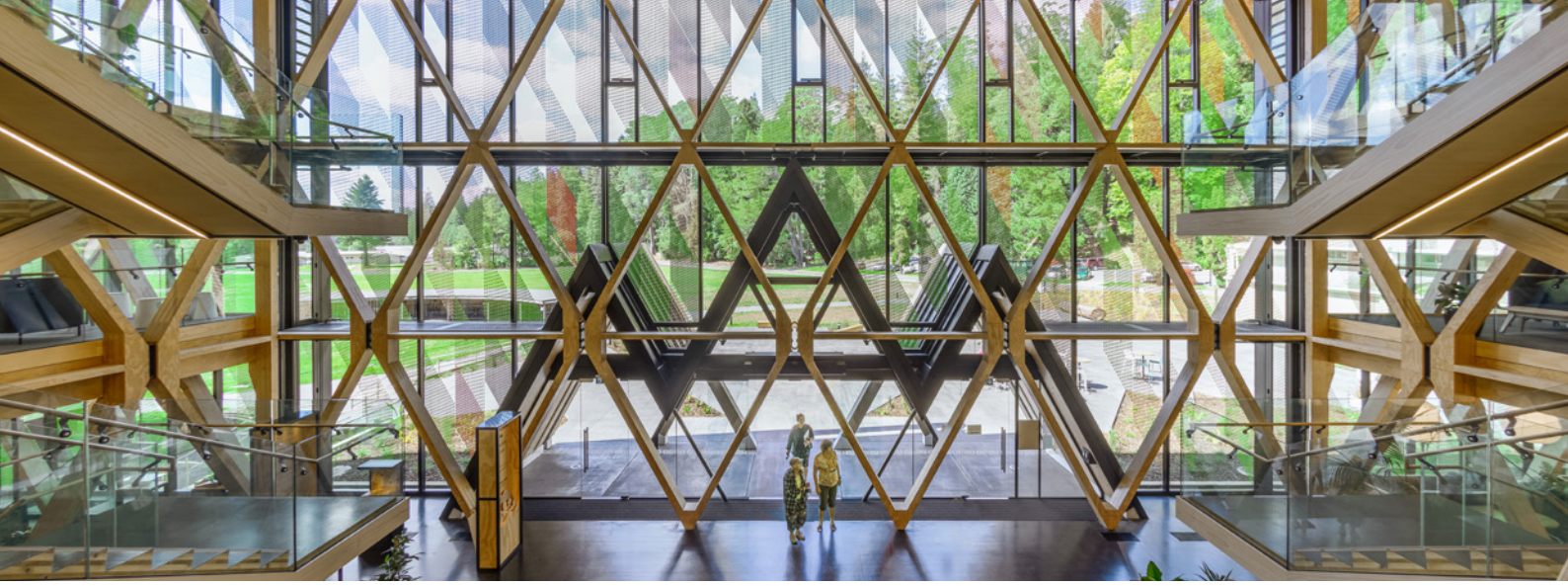
4ha

550m³ is the same amount of structural timber from just 4ha of radiata pine forest

Engineered timbers used are laminated veneer lumber (LVL), cross laminated timber (CLT) and Glulam

New Zealand radiata pine forests can regrow 550m³ of wood in only 35 minutes

One of the first CLT lift shafts in the world



Design and construction facts

Te Whare Nui o Tuteata, a three-storey, 2000 m² building, is believed to be a world first for a wooden diagrid structure of its size.

Diagonal grid structures (diagrids) are an efficient way to provide strength and stiffness and require less material than traditional structures.

Engineered timbers have been used for their physical properties, sustainability and environmental performance.

- The diagrid frames and entry canopies use Glulam and laminated veneer lumber technology
- The floor beams and roof trusses have been manufactured from laminated veneer lumber
- The floors, lift shaft panels, suspended staircases and meeting room bracing is made from cross laminated timber (CLT)

Performance and safety. The connections between the diagrid units include a steel component designed to deform during severe earthquakes to protect the building. These components are replaceable.

Stored carbon. The 454m³ of structural wood in the building stores approximately 418 tonnes of CO2-e. This is equivalent to the emissions of 160 people taking return flights from Auckland to London. New Zealand radiata pine forests can regrow this amount of wood in 35 minutes.

Features. The atrium ceiling was inspired by the structure of the radiata pine genome. The atrium ceiling lights are positioned to reflect the Matariki star cluster. Traditional tukutuku weaving inspired the design on the double-skin glass façade, which provides heat recovery in winter and regulates thermal gains in summer. Other energy saving features include natural ventilation, solar shading and LED lighting.

Kowhaiwhai designs

The kowhaiwhai designs were gifted to Scion by Ngāti Hurungaterangi, the haukāinga or local people. The designs come from their wharenui at Hurungaterangi Marae, Ngāpuna.

The puhoro design on the middle peak of the building represents swiftness, speed, strength, strategy and agility. It is often seen on the prow of a waka indicating a journey, direction and forging new horizons.

The mangōpare design on the outer peaks of the building represent the hammerhead shark and depict strength, power, caring and guardianship. It also represents the various guardians who guided the journeys of ancestors. The mangōpare is also depicted on entry doors, the ceiling of the mahau/entrance way, and throughout the building.

The team

ARCHITECTURAL DESIGN	RTA Studio, Irving Smith Architects
STRUCTURAL ENGINEERING	Dunning Thornton Consultants
ENGINEERED WOOD FABRICATION	TimberLab/XLam
CONSTRUCTION	Watts & Hughes
PROJECT MANAGERS	RDT Pacific
EXHIBITION DESIGN AND INSTALLATION	The Gibson Group
ELECTRICAL ENGINEERING	Professional Consulting Services
MECHANICAL AND HYDRAULIC DESIGN	eCubed
FIRE ENGINEERS	Cross Fire

The name 'Te Whare Nui o Tuteata' was gifted by Ngāti Hurungaterangi, Ngāti Taeotu me Ngāti Te Kahu.

The name acknowledges the mana of their tupuna Tuteata, from whom the hapū descend and their connection to the whenua, Te Mingi.

For further information on Te Whare Nui o Tuteata visit
www.scionresearch.com/te-whare-nui-o-tuteata

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Prosperity from trees - *Mai i te ngahere oranga*

NOVEMBER 2022