

INNOVATION TO EXPAND TIMBER'S USE

Last year, the Structural Timber Innovation Company Ltd (STIC) was established, co-funded by government and industry, to develop timber buildings for a wide range of uses.

By **André Lovatt**, Chief Executive, Structural Timber Innovation Company Ltd, Christchurch

The Structural Timber Innovation Company (STIC) is a collective of major participants in the Australian and New Zealand timber industries and leading research organisations, which aims to lead a step-change increase in the number of timber buildings constructed.

Timber has long been used as a successful construction material. Focusing on non-residential markets, STIC will provide owners, builders, designers and developers with the tools to use timber building materials in applications that have traditionally used concrete and steel.

Drivers for change

Deep-seated drivers for change in the way we design and construct buildings underpin the STIC vision. The key drivers are created by:

- demand for sustainable buildings, renewable materials and reduced CO₂ emissions
- stated government objectives for carbon neutrality in the building industry and wider economy
- industry demand for prefabrication and integrated construction of long-span buildings
- the increasing importance of rapid reparability and re-use after extreme seismic and weather events
- strong international demand for low to medium-rise residential and commercial buildings as a result of demographic changes and urbanisation.

Innovative structural timber

STIC's research aims to develop different timber engineering solutions involving innovative large-span timber building technologies primarily for use in non-residential buildings up to 6 storeys or more with open, flexible layouts suitable for a wide range of uses. The main structural

members will be manufactured from engineered timber components including glulam and laminated veneer lumber (LVL) rather than traditional materials.

The key advances are:

- use of laminated veneer lumber
- a totally pre-fabricated building system
- potential use of post-tensioned tendons embedded in the timber to lock the system together.

Post-tensioning the structure enables fast and easy construction and guarantees a high level of earthquake performance. Post-tensioned floors enable the creation of very large open plan building layouts enabling flexible use without the need for closely spaced columns or walls.

Laminated veneer lumber

Laminated veneer lumber will be a major component of the structural elements (walls, beams, floors) in a building. It is made by peeling thin veneers, or layers, of wood from sustainably grown logs and then gluing and



Laminated veneer lumber roof lift at Whangarei mill. (Photo: Carter Holt Harvey.)

pressing the layers to form large slabs of layered timber.

The resulting product converts timber from a commodity into a highly valued high performance engineering material. Laminated veneer lumber has the high strength and reliability needed for use in commercial buildings.

From lab to marketplace

STIC's short-term priorities involve working closely with researchers at the University of Auckland, University of Canterbury, University of Technology, Sydney and BRANZ Ltd to address the needs of the industry and to take the new technology from the lab into the marketplace.

Consequently, time is being well spent answering questions about structural and seismic performance, constructability and cost, fire safety, acoustics, durability, sustainability and thermal performance. Robust answers are needed to achieve widespread adoption in the construction industry.

The STIC research programme will produce comprehensive design guides for designers, regulators, manufacturers and builders.

For more information, see www.stic.co.nz. ◆

STIC investors

The New Zealand government is the largest investor in STIC, through the Foundation for Research, Science and Technology, which provides dollar-for-dollar matching with industry. Founding industry shareholders are BRANZ, Carter Holt Harvey Woodproducts, Nelson Pine Industries, New Zealand Pine Manufacturers' Association, University of Auckland, University of Canterbury and Wesbeam.

Forest and Wood Products Australia is also a major contributor to STIC.