

THE BENEFITS

OF WOOD IN COMMERCIAL AND FARM BUILDINGS

Cutting Edge

In recent years there has been a concerted research and scientific effort into increasing the use of New Zealand's forestry resource in commercial construction.

Significant investment has been made in research and development by the timber industry in partnership with government agencies.

The outcome is that developers looking to build large scale single level buildings such as warehouses, sports arenas, community halls or low rise multi-storey office /retail space can specify wood and be assured of advantages and cost benefits that alternative materials cannot hope to rival.

The innovation and endeavour behind engineered timber has inspired much more energising design and installation.

Engineered Timber

Engineered timber is manufactured at plants across New Zealand. It improves the load bearing and structural strength of timber.

This means that engineered timber is competitive with steel in its onsite /installed properties but as a wood based product it offers the additional benefits of sustainability, versatility, aesthetic warmth and appeal, predictability /performance under fire and damage resistance under earthquake.

Engineered timber available in New Zealand:

Laminated Veneer Lumber (LVL) is a structural product manufactured from thin peeled veneers of wood usually 3mm thick, glued with a durable adhesive with the grain running parallel to the main axis of the member. Panels of LVL are cut into structural members which have high strength and stiffness.

LVL is suited to structural applications such as beams, rafters and columns in a wide range of buildings including houses, commercial, industrial and rural structures.

Glue-laminated timber (glulam) is the name given to large solid wood members manufactured by gluing many smaller pieces together. Glulam is an engineered structural material consisting of a number of graded, kiln dried and selected full length laminations - usually 45 mm thick - bonded with proven adhesives, to form a solid member of practically any length, shape or size.

Cross Laminated Timber (CLT) is a structural product suitable for load-bearing construction including multi-storey buildings.

New Zealand's first CLT plant is soon to be opened.

CLT is made of layers of solid timber, alternating grain direction at 90 degrees (where Glue-laminated timber is layered with the grain). The exterior layers' grains run lengthways giving optimum strength.

It can be produced with 3, 5, or 7 layers and the layers can be of different thicknesses (though symmetrical from the centre, i.e. 35mm, 27mm, 35mm).

This gives a number of different overall thicknesses, suitable for a large variety of end uses, given different strengths and physical characteristics.



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Continued

Engineered timber has a number of advantages over other wood-based materials:

- The wood resource can be optimised by grading and selecting veneer for different parts of a cross section and making a range of products with different properties.
- There is an increase in strength. The strength of a single piece of timber is as strong as its weakest point, which is usually the largest knot.
- In laminating, the weakest point of one piece of timber is bonded to the higher strength of adjoining pieces, thus forming a homogeneous structural component of great efficiency.
- It therefore is possible to manufacture a beam with high strength timber in areas of high stress and utilise more economical lower grades in areas of low stress.
- The use of thin laminations also permits better penetration of preservative, enables better and more even drying, eliminating checking, and member size is virtually limitless.
- In addition the thin laminates enable the member to be finished with a curve if desired to accomplish striking architectural features.

What this means?

Multi-storey and long span constructions from engineered timber are not only feasible but very desirable, with affordability against the equivalent in concrete and steel and the added benefit of sustainability and zero carbon construction.

In post earthquake Canterbury the advantages to timber buildings are numerous:

- Timber buildings are up to a third of the weight of the equivalent concrete building giving huge advantages in difficult soil ground conditions.
- Timber has excellent properties in seismic design, which improves and leads to damage avoidance designs.
- As a building material it is cost competitive due to increases in productivity and improved manufacturing methods.
- It is a growing resource with a beneficial value chain.
- Engineered timber represents new technology that builds on proven materials available now, tested and verified.

For more information we invite you to call the NZ Wood Timber Design Advisory Centre which is aimed at facilitating larger scale commercial projects using engineered timber. In addition NZ Wood can coordinate free initial structural engineering consultants to assist in the planning and feasibility of your requirement.

NZ Wood is supported by a number of structural engineering consultants and has close relationships with the Structural Timber Innovation Company (STIC) based on the engineering campus at the University of Canterbury and the Timber Design Society of New Zealand.

