



RED STAG TIMBER: SHED 3

Case Study



PROJECT INFORMATION

Client	Red Stag Timber
Project Name	Shed 3
Region	Rotorua, Bay of Plenty
Build Type	Industrial Warehouse / Processing Building
Brief Building Description	Clearspan timber framed building, combination of CLT and Glulam engineered timber
Number of Storys	One 15m to the apex of the building

PROJECT TEAM

Developer	Red Stag Timber
Client	Red Stag Timber
Architect	Structural Concepts
Project Team	Red Stag Timber
Builder/Contractor	Max Edkins Builders
Structural Engineer	Structural Concepts & Arthur Budvietas
Fire	Argus Fire

PROJECT BACKGROUND

Red Stag Timber is New Zealand's largest sawmill producing both Radiata Pine and Douglas-fir (Oregon) framing timber for the New Zealand, Australian and Pacific Island construction markets. Red Stag also produces other timber products for landscaping and DIY renovations, as well as timber for manufacturing furniture or packaging products.

Due to an increase in demand for its products, Red Stag Timber needed to increase its saw milling capacity. As part of this planned upgrade, a significant new building was constructed on site.

This building will initially be used for CLT feedstock dry storage and in two to six years' time is expected to be extended to house a new planer and sorting line.

Construction of the building commenced in the 4th quarter of '23 and was completed in August '25.

BUILDING SPECIFICATIONS

- Length: 200m
- Width: 65m
- Apex height: 15m

BUILDING USE

- The new building is approximately 200 metres long by 65m wide. The floor area of 13,000m² is to be a clear span un-interrupted with 9 meters clearance height to the column knee joints.
- The building was built in stages with the western end (90m length) constructed first and used for timber storage.
- The construction process will accommodate the building's final use (to house the G3 Planer and ancillaries) with suitably designed footings and floor system to initially store timber and later to house the new planer line.

CONSIDERATIONS

- Timber storage layout and height was arranged to allow forklift in-loading and out-loading.
- Timber packets will be stored up to a maximum height of 5m in rows at 7m centres with 2 x 11m forklift operating isles longitudinally in line with the vehicle entry/exit doors. On this basis, the building has capacity to store a maximum of 10,300m³ of sawn timber.
- Due to the quantity of timber stored in the building, a full coverage fire sprinkler system in the building was used for asset and product protection.

BUILDING DESIGN

Red Stag Timber saw the opportunity to showcase timber construction with this new extension to their plant and support the use of energy efficient materials in construction.

The building is predominantly of timber construction with Coloursteel clad walls and roof. The roof has a code compliant wrap and netting lining to stop condensation and provide insulation.

The building has been designed as a single span structure using a combination of Cross Laminated Timber and Glulam for most primary components of the building structure.

The building floor height is a compromise between minimum excavation below the current ground level and suitable ramp access from existing roadways to the vehicle entry doors.

The building has been designed with ground level gutters to collect and direct roof water to local storm water drains.

LOCATION

- The new building is located within the current Red Stag Timber operational site.
- The CLT Feedstock Storage Building is positioned approximately 34m inside the Southern site boundary and approximately 20m to the East of existing Shed 9.
- The area was used for despatch storage, with old rail lines in the ground area, old concrete building foundations, and various site services running above and underground such as storm water, HV power lines above and below ground, and including fibre optic communications cables which run to various areas of the site. Overhead services were relocated but some of the underground services remained in place.
- Following completion of geotechnical investigation, the building footings system was designed using driven timber piles with concrete footings and floors over the timber piles.

PROJECT LEARNINGS

- The use of CLT for bottom chord tie beams in the roof trusses removed the need for fly bracing as the extra thickness of the CLT beams overcame the slenderness ratio issue.
- Moisture control was important when CNC machined holes are required to line up across three layers of timber (knee joint assemblies).
- Having a well planned assembly/lifting plan for major components saved a significant amount of time.
- Timely installation of cladding was critical in order to meet project deadlines.

THE PROJECT OVER TIME





ABOUT THE MID-RISE WOOD CONSTRUCTION PROGRAMME

Mid-Rise Wood Construction is a partnership between the Ministry for Primary Industries (MPI) and Red Stag Investments Ltd. The aim of this programme is to encourage widespread adoption of precision-engineered timber in mid-rise building construction. Since its inception in 2018, the programme has assembled a pool of New Zealand professionals experienced in mid-rise wood building design and construction to help share and grow knowledge and expertise with the broader industry.

Engineered timber is not only naturally beautiful but also provides a very strong, low carbon and comparably low-cost alternative to steel & concrete. It is easy to transport, relatively light, and has outstanding earthquake and fire resilience.

The use of prefabrication can decrease construction time by as much as 30 percent, and reduces costs compared with traditional building methods. Combining Cross-Laminated Timber (CLT), laminated veneer lumber (LVL), glulam and panelised framing timber creates a cost-effective, fast, resilient and sustainable system for mid-rise construction.