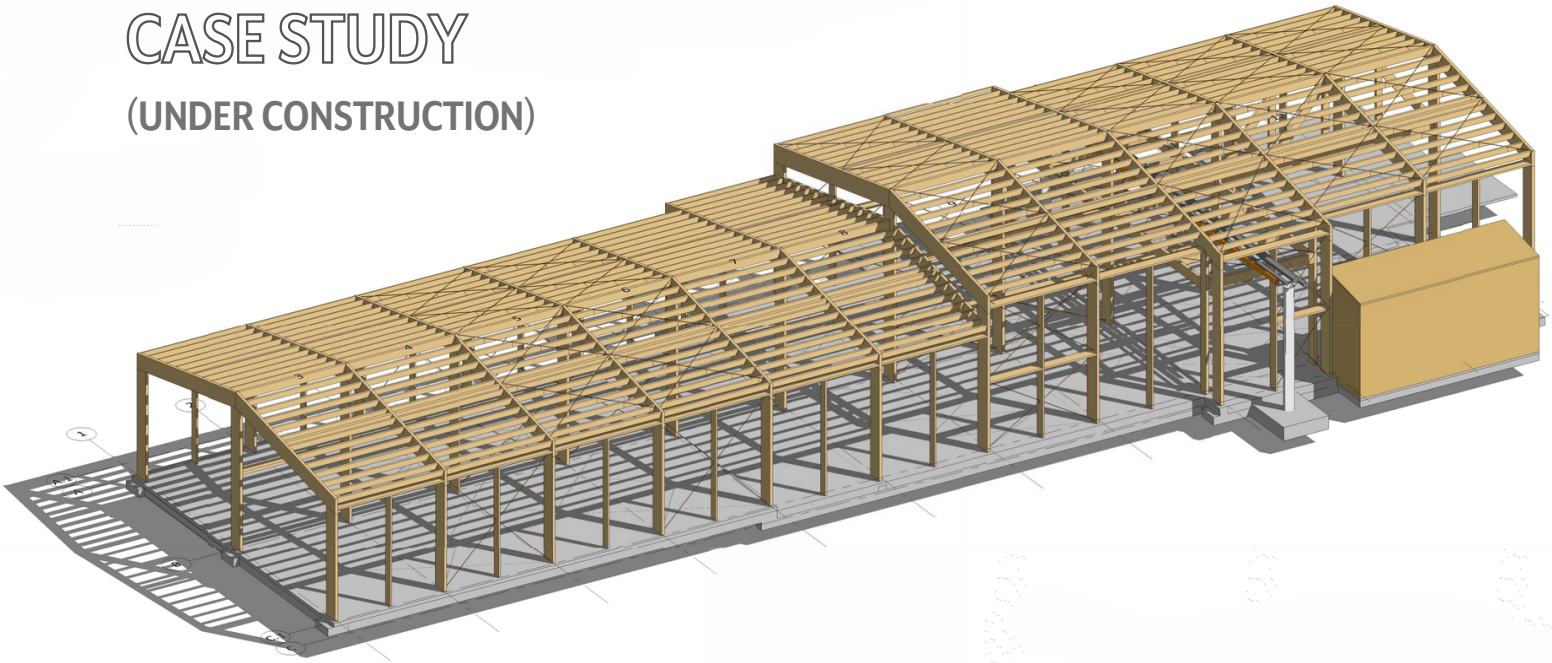
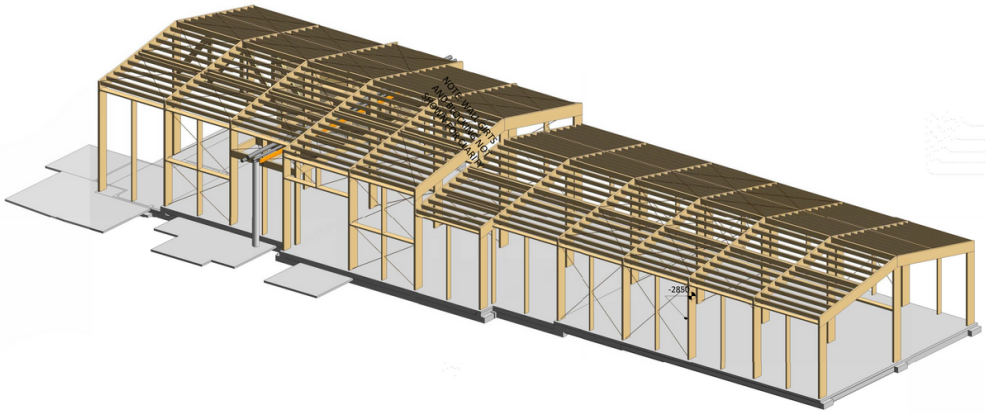
RED STAG TIMBER - TRIMLINE BUILDING

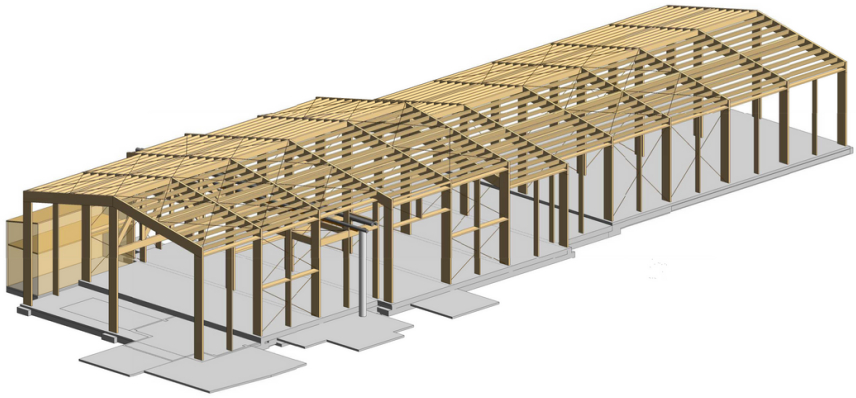
WAIPA STATE MILL ROAD, ROTORUA

CASE STUDY

(UNDER CONSTRUCTION)





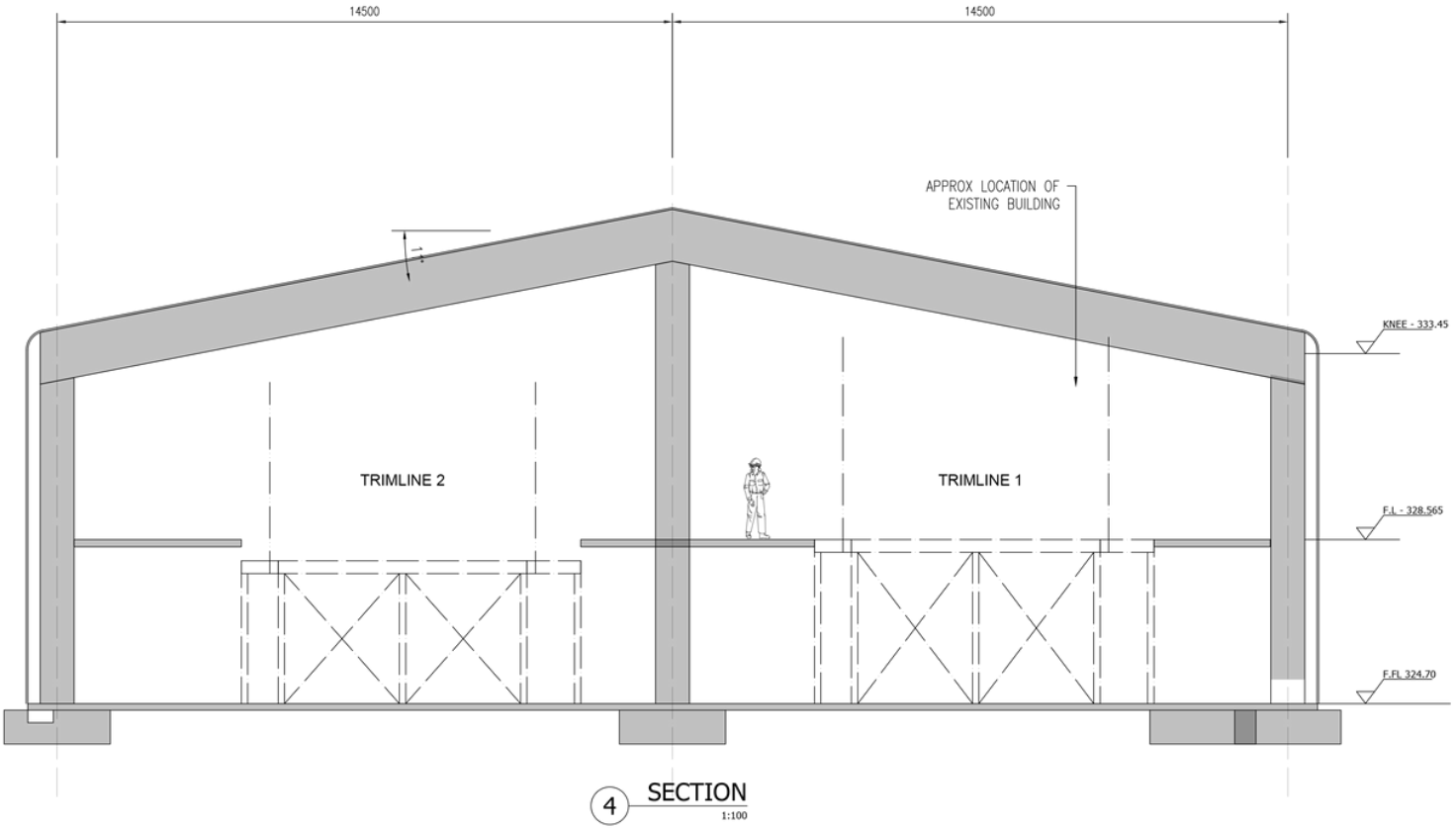


Ministry for Primary Industries
Manatū Ahu Matua

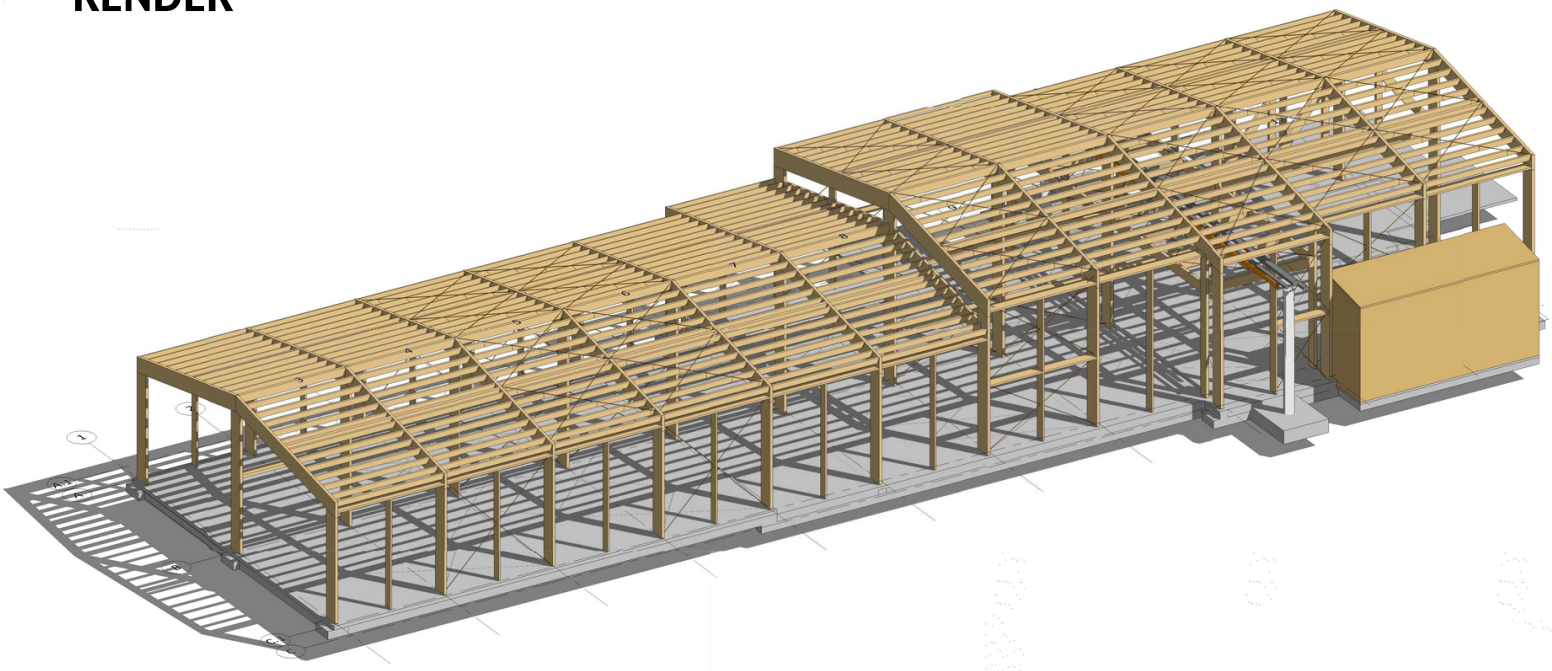
RED STAG TIMBERLAB

MID-RISE Wood Construction

CROSS SECTIONAL DRAWING



RENDER



MID-RISE Wood Construction

MASS TIMBER MATERIALS USED, AND WHERE

Building Info:	The trimline and bins are the back-end of the sawmill. Timber is trimmed to length and then scanned to drop it into the appropriate bin for the grade, length and width. The new building will straddle the current trimline and allow room for a future trimline which will be required as the mill expands. Notably, this is the second building to leverage CLT columns and beams as this is a cost-effective construction technique. These are designed using the CLT technical design guide. Using CLT in place of LVL and Glulam brings capacity to the NZ mass timber market. Maximum lengths of CLT is 16.9m.
Year built	2023
Dimensions (L/W/knee/apex)	93.5m/29.8m/9.3m/13.9m
M3 internal area	26,754m3
Build Cost	$4.4 million
Build Cost /m2	$1,774
Portal columns	1288x210 CLT5-ply 1152x210 CLT5-ply 720x225 GL8 1125x225 GL8
Portal beams/truss	1288x210 CLT 5-ply Beams 1152x210 CLT 5-ply Beams 1125x225 GL8 Beams
Girts	240x45 SG8
Purlins	465x126 CLT3 ply
End wall columns	1152x210 CLT5 ply
Positive Environmental Impact	Estimated Sequestered Carbon: 33 tons of Carbon and 121.44 tonnes of Carbon Dioxide.

MATERIAL SUPPLIER OF MASS TIMBER

Portal columns	Red Stag TimberLab - redstagtimberlab.co.nz
Portal beams/truss	Red Stag TimberLab - redstagtimberlab.co.nz & Techlam for GL8
Girts	Red Stag TimberLab - redstagtimberlab.co.nz
Purlins	Red Stag TimberLab - redstagtimberlab.co.nz
End wall columns	Red Stag TimberLab - redstagtimberlab.co.nz

DESIGN/CONSTRUCTION TEAM

Main contractor	Max Edkins
Engineer	Structure Designs

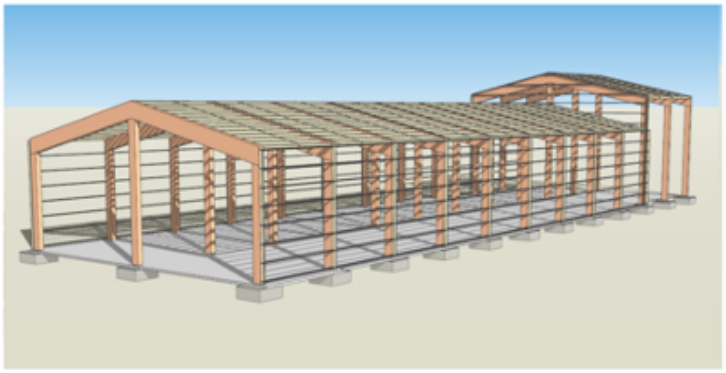
V-QUEST ANALYSIS

	Mass Timber	Hybrid ***	Concrete/Steel **
	$	$	$
Cost	2,715,454	2,665,440	2,508,918
	Kgs	Kgs	Kgs
CO2-e	-115,655	-56,675	406,942
Weight	1,735,227	1,675,651	1,530,150

- All Carbon data based from Branz CO_2NSTRUCT
- CO_2 calculated for LCA modules A1 - A3 only
- Costs and carbon include all impacts associated with the core structure material selection, including connections, foundations, slab, piles, cladding, girts and purlins, and an allowance for the P&G difference associated with construction speed.
- All costs are exclusive of GST

** Assumes steel superstructure

*** A theoretical hybrid design was also modelled for this building using the assumption that the timber purlins and girts are only supporting cladding (ie. not structural), and could be changed out for steel. When this is the case, the change brings costs down slightly as shown, but increases the CO2-e of the building. Where the purlins and girts are providing lateral structural support the required steel would make 'hybrid' uneconomic and worsen the CO2-e emissions.



ABOUT THE MID-RISE WOOD CONSTRUCTION PROGRAMME

Mid-Rise Wood Construction is a six-year partnership between the Ministry for Primary Industries (MPI) and Red Stag Investments Ltd. The aim of this $6.75 million 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.

For more information, go to www.midrisewood.co.nz