RED STAG TIMBER - STACKER BUILDING (CONSTRUCTED)

WAIPA STATE MILL ROAD, ROTORUA

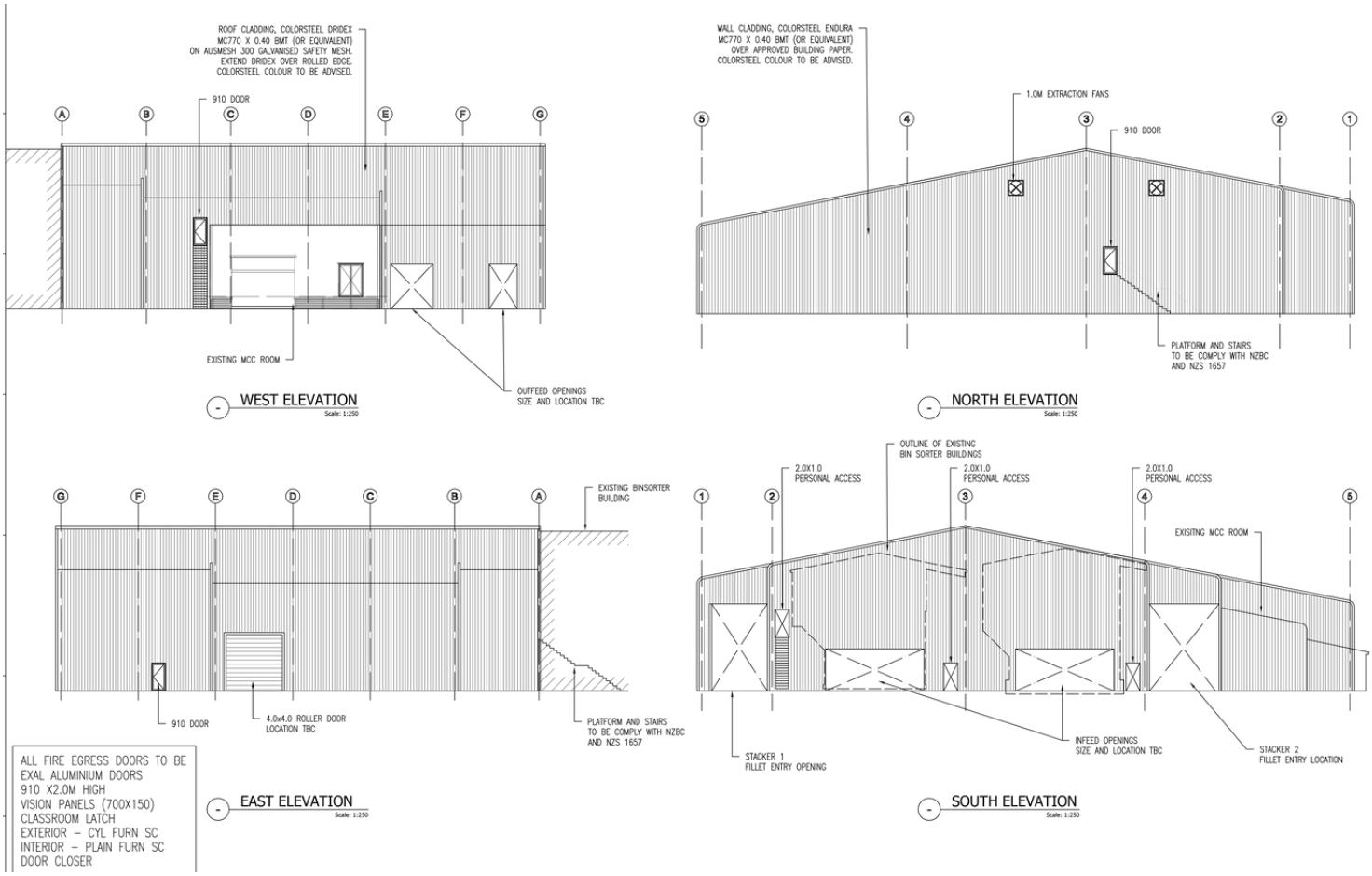
CASE STUDY

Ministry for Primary Industries
Manatū Ahu Matua

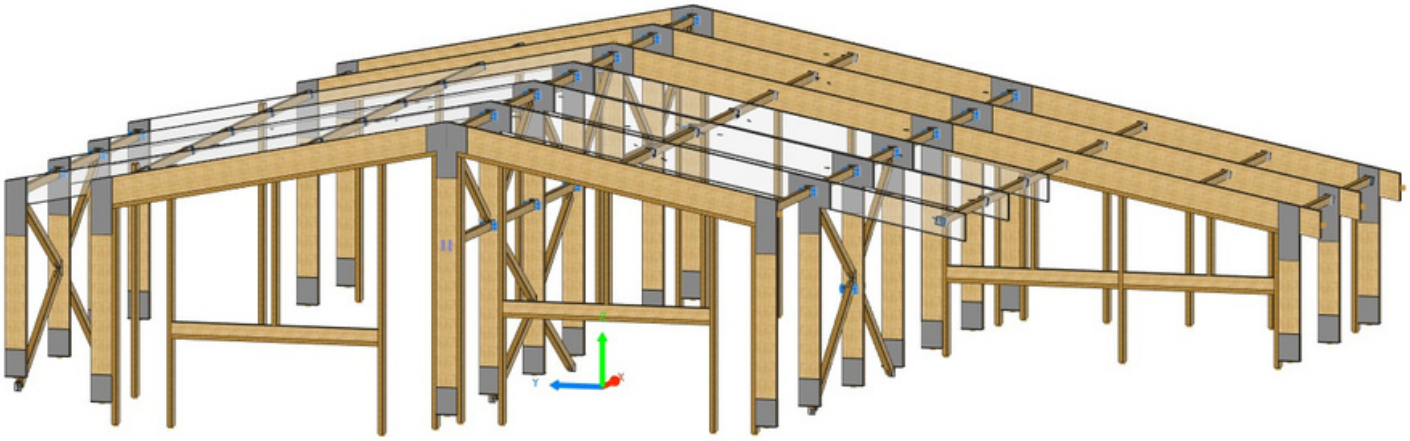
RED STAG TIMBERLAB

MID-RISE Wood Construction

CROSS SECTIONAL DRAWINGS



RENDER



MASS TIMBER MATERIALS USED, AND WHERE

Building Info:	The stacker building automatically stacks timber, 80 percent of which is filleted to be kiln dried. Notably this is the first building that used columns and beams ripped from CLT panels. CLT panels can be made up to 16.9m at Red Stag Timberlab, so any beams longer than that were done in glulam. The new stacker will connect to the paned new trimline building and de-bottleneck the back end of the sawmill.
Year built	2022-2023
Dimensions (L/W/knee/apex)	44.5m/34m/8.2m/11.4m
M3 internal area	14,825m3
Build Cost	$1.7 million
Build Cost /m2	$1,532
Portal columns	800 CLT5/166 Columns
Portal beams/truss	1000x166 GL8 Beams 1000x166 5-ply CLT beams 300x166 5-ply CLT struts
Girts	190x45 / 290x45 MSG8
Purlins	290x45 MSG8
End wall columns	800x166 5-ply CLT Columns 450x166 5-ply CLT Windposts

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 Timber
Purlins	Red Stag Timber
End wall columns	Red Stag TimberLab - redstagtimberlab.co.nz

DESIGN/CONSTRUCTION TEAM

Main contractor	Hawkins / Max Edkins
Engineer	Structure Designs

V-QUEST ANALYSIS

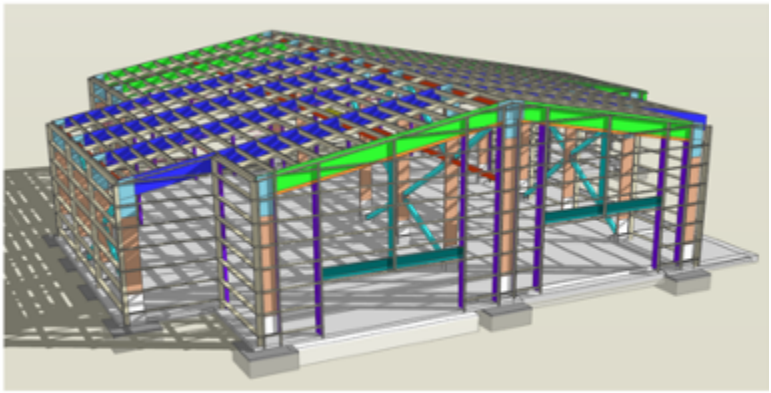
	Mass Timber	Hybrid ***	Concrete/Steel **
	$	$	$
Cost	1,625,498	1,525,517	1,580,954
	Kgs	Kgs	Kgs
CO2-e	25,854	93,410	333,588
Weight	1,195,582	1,177,842	1,151,452

- 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

* For structural reasons hybrid options were limited in this case

** 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.



FLY-OVER LINK

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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