

National Wine Centre Adelaide Botanic Gardens Australia

Continuous 22m long curved glulam columns designed and manufactured in New Zealand were part of the solution to another award winning timber structure in Australia.

Tender was won by Timber Engineered Structures Melbourne against a number of local manufacturers. Their Bid comprised the expertise and manufacturing experience of McIntosh Timber Laminates Ltd – New Zealand for the tapered columns and Melbourne production of all diagrid components and hardware.

The diagrid/column support design was the first of its type used in Australia. The roof consisted of four curved two dimensional suspended curved “net” constructed with some 1200 Hoop Pine Glulam Struts connected by steel nodes.

It is supported by 32 pairs of post-tensioned stainless steel cables. Prototypes of testing were carried out by TES and Hansen and Yuncken to establish compliance and design performance of all components.

The roof was constructed on the ground in four segments in a specially made survey jig. Each segment was then lifted individually on a lifting frame.

The main concourse feature is the twelve 22m long tapering glulam pine columns treated to H3 CCA treatment supporting the twin cables post tensioned rod into a dramatic “pineapple” effect using glulam and plywood.

The roof material used was rheinzinc membrane to both horizontal and vertically clad surfaces. The curved geometry of these surfaces required that 1180 rheinzinc panels were individually shop drawn, rolled to its tapered shape on a purpose built roller. All of the seams between the panels were individually hand crimped.

The rammed earth walls used on the project are some of the largest constructed on a commercial site in Australia. The 400mm thick walls were constructed in 600mm high lifts between timber faced formwork.

The National Wine Centre is a glowing example of utilising the challenges presented in unique architectural and engineering design which can be met with the dedication and experience of the project construction teams and sub contractors alike.

The success of this project has been primarily due to the co-ordination of these teams to produce such an innovative structure.

The project won the Architecture award at the 7th World Conference on Timber Engineering 2002 held at Selangor, Malaysia.

- Architect – Cox Grieve – Adelaide
- Engineers – Wallbridge & Gilbert – Civil – Adelaide
Mark Batchelar – New Zealand
- Builder – Hansen & Yuncken
Project Manager: Chris Coulter
- Steelwork – Somaras Group – South Australia
- Manufacturing – McIntosh Timber Laminates Ltd – curved beams
Timber Engineered Structures – Melbourne
Diagrid Components and Roof Membrane
- Timber Species used:
 - Tapered Curved Glulam Columns (500 to 250 x 200)
 - Radiata Pine (12 off)

 - Diagrid roof: select Hoop Pine Glulam (F8) 200 x 60
Struts / 150x60 joists

 - Diaphragm (1200M2) – 2 layers of ply A/C Hoop Pine
Ply (12mm) C/D Radiata Pine Ply (12mm)

- Timber treatment – Diagrid/Roof components Fire X treated to comply with class 2.9 buildings. BCA compliance.
- Roof Hardware – 3/4/6 way structural steel nodes.
12mm stainless steel cable with fixing and turnbuckles each end.
10mm dia stainless steel bolts with 64mm dia shear plates.
- Delivery of beams – Shipped from Auckland to Port Adelaide
18th September 2000.

