timber takes on the heavyweights

As the residential market becomes increasingly more competitive, many fabricators are looking towards the larger commercial and Multi-Residential Timber Framed Constructions (MRTFC's). With the ever-present fluctuations in new home developments, these larger projects can actually provide the astute fabricator with a lucrative source of extra revenue.

Whilst large-scale projects can 'tie up' a fabricators operations for some time, when well planned into a plant's operating structure, they can be a real boost for the business. One of the key features of many of these large jobs is: they can present the fabricator with some rather interesting design challenges. That's where the versatility of timber really can make a difference.

These larger projects have been dominated in the past by masonry and reinforced construction… even all steel framing. However timber is now proving a more than worthy adversary to these solutions. Much of this is due to the amazing advances made in timber engineering in recent years, especially when using MiTek's extremely powerful 20/20 program.

MiTek's 20/20 program gives the viewer fully rotational 3D visualisation, plus extremely accurate detailing and estimating.

Bruce Wallace, Operations Manager of Bendigo Truss is no stranger to large, sometimes challenging jobs: "there were some very demanding engineering requirements with this project. Even though the bulk of our work is residential, we still tend to do four or five commercial jobs a year, but very few are anywhere near as complex as this one."

This recent 60 bed Nursing Home presented Bendigo Truss Plant with some very unusual problems. Engineering problems to be exact. First, the actual architectural configuration was designed as a large 'X', with four wards (or wings) emanating from a central hub. At the end of each wing there is an open-air courtyard, encompassed by a rather complex pentagon shaped roof. In all, there were over 560 trusses covering a floor area in excess of 2,700square metres. The whole roof had to be built with all the usual commercial requirements and a few other hidden surprises as well.

There had to be a permanent, central 'catwalk' in the roof structure. This mechanical services platform was required to ensure easy, on-going access to all services housed in the roof. Plus, a labyrinth of ducting and wiring had to be accommodated. Bruce got MiTek involved right from the start, explaining: "normally we'd do all our own design and detailing, but with our most experienced detailer on extended leave overseas, we felt more confident getting MiTek to do the work for us," said Bruce. "However Daniel Young, our Senior Detailer and David Jenkin our resident CAD whiz worked very closely with the team at MiTek …for nearly 3 months."

"no challenge seems too big for MiTek's 20/20 program"

It will also look for the most design and cost-effective solution for even the most challenging and complex roof truss requirements. An excellent example of this can be found in a recent and, rather unusual Nursing Home in Bendigo.

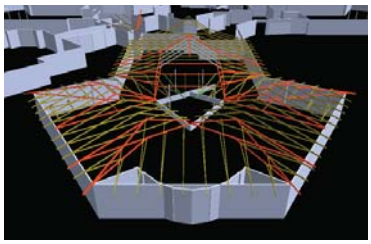
Supplier of roof trusses: Bendigo Truss Plant.

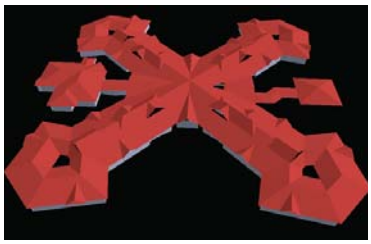
Software program: MiTek's 20/20

20/20 ADVANTAGES:

- **Fast, accurate detailing**
- **Fast, accurate estimating**
- **3D visualisation – with image rotation**
- **Improves manufacturing efficiencies**
- **Design versatility**
- **Colour print-outs work as an on-site guide for roof assembly**

For the team the challenges didn't stop with standard commercial requirements though. Adam Dennaoui, MiTek Victoria's Senior State Engineer explains: "we had to strategically place every truss to ensure all services ran smoothly through the roof design. There were some heavy, commercial grade air-conditioning systems that had to be supported by the roof too. The actual design complexities of the roof definitely gave us quite a bit to think about. There were some bell-shaped trusses (several with gable ends) and half-a-dozen different pitches in the roof. These pitch variations ranged from 9 degrees, right through to 31.5 degrees," added Adam. Let's not forget, this was a 'purpose-built' 60 bed, Nursing Home…so every room had to have a bed-lifting crane, each of which is attached to the ceiling! As a result, there were even more extra load-bearing requirements that needed to be factored into the final truss solution. "This job had it all," said Adam. "We incorporated double, triple and even some hardwood trusses to reach our load-bearing requirements. Even MiTek eliminators were used to give the trusses that extra load-bearing support."





"Everyone worked together really well and I'm sure this job could have turned into a nightmare if it weren't for the 20/20 program, "explained Bruce. "It was excellent… especially for the more complex areas of the roof. With 20/20 you can click on an area of the design, zoom into it – and get a 3D visual of it from all angles. It was great for dimensions, that's for sure. We would even laminate the colour print outs for the builders to refer to on-site."

This job certainly boasts many statistics, intricate designs, extraordinary load-bearing demands and complex features. However one of the facts that Bruce finds most insightful to the nature of this project is "there were over a ton of special steel connectors used!" That's a lot of steel for an amazing timber truss solution to a large-scale commercial problem. Which poses the question: 'could this have been done in steel?' "No way," said Bruce. "Steel is nowhere near as versatile as timber and a lot more expensive. The architect actually specified a timber-trussed roof." The results speak for themselves.

MiTek®

creating the **advantage**

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Bruce Wallace Operations Manager, Bendigo Truss Plant, Bendigo, Vic