BENDING OVER BACKWARDS

■ *Produced at the fabrication plant of Calco Timber in Geelong (Vic), these curved Posi-RAFTERS were to be used in a residence on Victoria's coastline.*

We all know the more adventurous architects like to bend the rules. It's their way of injecting some individuality into their designs - and architect Steve Hofer of Williams, Kaye, Hofer Architects, based in Mornington on the Victorian coastline, is no exception.

In fact, they pride themselves on some of the more unique creations seen along the Mornington Peninsula.

Another important point that sets them apart from many other architects is their preparedness to readily adopt innovative building methods - one of these being MiTek's Posi-STRUTS. Especially 'curved' Posi-STRUTS or Posi-RAFTERS as they are often called.

When Steve designed a new, two storey home high on a hill in Mount Martha, overlooking the scenic Port Phillip Bay view below he had a particular design in mind - one that incorporated a large curved roof.

Much of the frame of the house was to be made in steel, however the cost of a steel roofing frame and several delivery complications meant Steve had to look at another roofing solution.

He'd seen curved Posi-STRUTS used in other applications successfully before and wanted to know more. His investigations took him to MiTek and then on to Calco Timbers, in South Geelong.

"Calco have been producing curved Posi-STRUTS and Posi-RAFTERS for years," said Nick Kandyliotis, one of MiTek's state engineers.

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"They're really proficient at it - so when the call came from Steve we knew Calco would be perfect for the job."

Even though Calco do all the manufacturing of the Posi-RAFTERS, MiTek still needed to do all the engineering computations.

"Because the house was situated high on a hill we had to factor in several things, one of the most important being excessive wind loadings," added Nick.

All the design and detailing was done on MiTek 20/20 then CAD drawings were given to Steve for final approval. The challenge to produce the Posi-RAFTERS was then handed over to Paul Colless, prefabrication manager at Calco.

"We've been a MiTek Fabricator for over 25 years and were one of the first to incorporate Posi-STRUTS into our plant's operations some 10 years ago," said Paul.

"Since then we've produced a lot of curved Posi-STRUTS and we actually have a specially designed Sliding Press to manufacture them. It's been developed to house special tooling and clamps for curving the hardwood timber top and bottom chords.

■ *Wind was one factor to be addressed on this hilltop site.*

"We don't cut into the chords or moisten the timber (in the same way as a boat-builder might do to curve timber) because the engineering of the Posi-RAFTERS could not be compromised in any way."

The spans of the Posi-RAFTERS to be used on this particular job were over 13m each.

Fortunately the job was simplified as all the Posi-RAFTERS were of equal length - some 30 in total. Being so long, each chord had to be spliced with nailplates before it could be curved.

They were then placed on the Sliding Press and manually bent into shape. The clamps locked each chord into position and the Posi-WEBS pressed into position.

"There was a little bit of 'spring-back' associated with each Posi-RAFTER, but that was factored into the engineering by Nick," added Paul.

Nick agreed: "we did stress tests on all the designs to ensure the final result was attainable."

So 30 Posi-RAFTERS later there was still another hurdle to overcome.

"Getting them on-site was no easy task either," Paul added. "That might have been another reason why the architect opted for a lighter weight solution."

The challenge? As noted, this house sat high on top of a hill. The road to the site was difficult and access for large vehicles was not possible.

"They had a crane on-site (I don't know how they got it up there) but we had to park on a road well below the house. The rafters were then hoisted up the side of the hill and eventually on to the roof," Paul noted.

The final result? Perfect! And as for architects throwing up new and exciting challenges?

"We love them. It's jobs like this that give us the opportunity to show just how flexible timber solutions can be. Architects will always be looking for an edge and we believe Calco and MiTek can answer just about anything they throw at us," boasted Paul. Even the odd curve ball! TTN

■ *The curved roof in position, MiTek's Posi-RAFTERS completed the job design by architect Steve Hofer, utilising timber over steel in this instance.*