

# sculpture by the sea

An extraordinary design calls for extraordinary construction. Gabrielle Chariton finds out how this inspiring piece of architecture was brought to life.

**T**he moment Victorian builder David Martin saw the plans for the Croft House he knew he wanted to build it. 'It was so sculptural and as soon as I saw it, it just caught my eye,' he says. 'Any different path of building that looks great and has got certain functionality to it really appeals to me. I thought it would be an amazing project and a real challenge to build.'

This two-bedroom home, fearlessly designed by architect James Stockwell, is striking in its originality and

ingenuity. Located on a pristine seaside block about five kilometres outside Inverloch in southern Victoria, its elegant, arcing form was inspired by the region's incredible sand dunes, which are whipped into their distinctive shape by the Roaring Forties that howl across this rugged part of the coastline.

The building's shape mimics that of a barchan sand dune: a peaked crescent, bisected at the apex by a delicate ridgeline that arcs between the endpoints, also known as a transverse sand dune. The inner curve creates a courtyard that opens from the main living areas – a sun-soaked sanctuary from the prevailing winds.

The structure is compelling to look at and clad entirely in corrugated zinc sheeting, with square slices of glass cut in at symmetrical points to admit the northern sun and water views, its multifaceted façade is stark, yet complex.

Adventurous architecture demands a great deal more than text-book know-how from its builders, and this home was no exception. Inverloch building firm Martin Builders, headed up by David Martin, specialises in building architect-designed homes up and down Victoria's Gippsland coastline, and proved to be the perfect match for this build. 'I seek out projects with a bit of difference,' David says. 'We like to work with designers and clients who maximise the potential of a building.'

With 14 years' experience behind him and an obvious passion for his craft, David was undoubtedly up for the challenge: a problem-solver with enough inventiveness, creativity and technical proficiency to interpret, then realise, James Stockwell's vision. 'From pen to paper on a job like that, I



Left: David Martin of Martin Builders.

suppose there's only a certain amount an architect can put down, and then it's really a matter of working in collaboration to pull it off,' he says.

But pull it off they did over 14 gruelling months. The first step was to pour an arc-shaped, square-edged concrete slab over which the roof frame was pitched. The external sections of concrete were poured last, formed with a chamfered edge that completes the line of the building. Externally, there is no delineation between the roof and the walls, and the entire crescent rises seamlessly from this bevelled concrete podium.

Visually, it's incredible. From a construction point of view, it was very demanding. 'It was a difficult build, lots of technical detail,' David says. 'It's not just one curve, it's built out of multiple radiuses, and trying to get those radiuses to line up to a smooth, consistent curve was a great challenge.'

Thanks to its elliptical shape, with the outer curve rising up to the ridgeline in a convex, and the inner curve falling away to the podium in a concave, the roof required



### Inspired by nature

The striking elliptical formation of the Croft House, based on the shape of a barchans (or transverse) sand dune, was conceived in direct response to the geography and prevailing winds that characterise the land the house sits on.

Sydney architect James Stockwell says that before putting pen to paper, he spent a few days on the property, getting a feel for how a home might work with the elements and the landscape.

'I noticed that all the trees were leaning towards the ocean ... as the Roaring Forties come powering across from the west,' he explained on 7TWO's *Sandcastles*, which dedicated an episode to this amazing house late last year. 'But this inlet turns to the east, so we could turn and face this sheltered piece of coastline. We just needed to turn our collar up to the wind, and then shapes started to emerge.'

just as many man-hours in planning and same – were erected over massive calculation as in actual construction. curved ring beams of laminated timber, braced by buttresses. The ring beams and the trusses,' David says. 'But we spent a lot more preparation time beforehand in the actual detailing and measuring, positioning, working out the correct pitch and angles.'

### 'It's built out of multiple radiuses, and [getting] a smooth, consistent curve was a great challenge'

The original design used a pitched roof, but during construction the owner decided to reduce the ceiling height. a great method to reduce the height and reduce costs was to use the scissor truss method, with LVL rafters, which gave a bit more room for insulation and a gap in the ceiling,' David says. of the spans involved, double trusses were used over two-thirds of the building. The softwood scissor trusses – about 50 in total, with no two members

acts as a top plate perimeter beam for the whole structure. So you could almost see the lintel and the top plate combined into one structure,' David explains.

Once the trusses were up, David says they switched back to more conventional construction methods, using catwalks and roof battens to tie the trusses together. 'The only difference was, we had to curve the roof battens and we also had to curve our catwalks. And we put in a couple of extra catwalks to hold the structure a bit stiffer and maintain consistent curves.'

As the framework went up, the building started to resemble the skeleton of a whale, the trusses curving gracefully towards the apex. David's innovative

system eliminated the need for a ridge beam. 'We nominated points that our truss apices would follow to maintain that curve and that eliminated any roof beam in itself, which reduced costs and saved time,' he says. ►



### High-performance home

While the Croft House challenges the established concept of what constitutes a family home, it is in fact incredibly practical to live in. For instance, the entire building – from the cladding to the polished concrete flooring and internal rammed earth walls, requires no paint and no maintenance, despite its proximity to the sea. The design is underpinned by solar passive principles, so there's little need for artificial heating and cooling. And the corrugated roofline lends itself to simplified water collection and management – runoff from the main part of the roof is collected in streamlined box gutters, then directed down internal downpipes in the buttresses and collected into a concrete tank. On the sections where the roofing hits the ground, water simply runs off and into a perimeter aggie drain, then out to the property's dam.

The cladding, a German product called Rheinzink, gives the structure a futuristic, unearthly, yet quintessentially Australian appearance. While it's new, the cladding is a metal, eventually blending with the moody grey skies which often characterise southern coastline.

Quite pricey but extremely durable – essential given the extreme coastal location – Rheinzink can be a tricky material to work with. 'There's a lot of little tricks,' David says. 'It does expand and contract a lot and you need to know the ins and outs of the product to actually use it to its potential.' And because it's softer and more flexible than standard corrugated steel, the battens were spaced at 450 centres to provide extra support.

The ridge-capping defines the shape of the structure, sweeping between the end-points in a flawless arc. So, just difficult is it to install a curved cap? 'Super difficult,' David says. 'There were only a couple of people in Australia who would actually curve them for us. Each piece is curved at a different radius, and each piece is actually

from plan view in one way, but from its elevation the other way. So we're trying to fold these in two actual directions.' In the end, the product arrived on site pre-fabricated to the radius curve and was installed in three-metre lengths. The curve formation lends the building an inherent strength, David says. 'That crescent shape holds a lot of structure in itself, and the side buttresses brace the whole section.' In order to anchor the buttresses without compromising the streamlined form, David used a product called Chemset. 'We drilled a hole in the concrete, filled it with a chemical compound, then put a galvanised threaded rod and that's what holds the buttresses' frame down.' While incredibly complex in terms of construction, the building has a pared-back simplicity, with structural members exposed as architectural features.

The curved structural ring-beam, manufactured from hardwood LVL, underpins the entire structure, which is machined back and left exposed above us. Likewise, the vertical, oval-shaped hardwood structural posts, sealed with

clear gloss, double as door jambs. From a construction point of view, this leaves nowhere to hide in terms of detailing and finish. 'It's a neat detail, there's no cover-ups or anything like that,' David says, who credits the extraordinary level of finish to the skills of his team.

Projects such as the Croft House – beautiful to some, inspiring to all – challenge our traditional concepts of housing, encouraging the industry to push beyond established boundaries and methods in terms of construction and design.

For David, the building is a testament to what can be achieved in a like-minded partnership: when adventurous design is brought to life with an equally fearless approach to construction. 'From the concept and the actual vision from the architect and the owner, to when my team and I came on board, we really pulled it off,' he says. 'I think that's probably the biggest achievement in **H**

