111
APRIL 2012
ARCHITECTURAL
STEEL INNOVATION
WITH BLUESCOPE STEEL

STEEL PROFILE

IREDALE PEDERSEN HOOK
FLORIDA BEACH HOUSE

ALLEN JACK+COTTIER
MILSON ISLAND SPORT
AND RECREATION CENTRE

IN PROFILE:
NONDA KATSALIDIS

EDITORIAL

Welcome to *Steel Profile* #111.

We are proud, as always, to bring you a collection of inspired and innovative steel architecture, and some glimpses into the creative minds behind it.

This issue features some notably reccurring themes. When asked why steel was chosen to embody their designs, the architects commonly cited its practicality, elementalism, economy and strength – all traits that contribute to improving the Australian architectural landscape.

We trust you will enjoy the issue. Please feel free to share your thoughts via info@steelprofile.com.au

We also invite you to submit suitable projects for consideration by our editorial advisory panel via www.steelprofile.com.au

Kristin Camery
BlueScope Steel editor

EDITORIAL ADVISORY PANEL

Steel Profile has established an editorial advisory panel to ensure that only projects of the highest calibre are selected for publication. The panellists are:

ADAM HADDOW

Adam is a director of SJB Architects NSW. He was awarded the 40th Anniversary Churchill Fellowship in 2006 to study alternatives to conventional models of urban design and continues to emphasise debate about the future vision of our cities. More than anything, he loves to design buildings.

FRANK STANISIC

Stanisic Associates founder Frank Stanisic is a Sydney-based architect and urbanist.

His work is fuelled by an evolving interest in the diagram and frame as a basis for architectural invention, and the aesthetics of permeability.

Frank's projects have won numerous awards including Australian Institute of Architects' Special Jury, Wilkinson, Aaron Bolot and Frederick Romberg

SAM BRESNEHAN

Sam Bresnehan is a graduate architect with Melbourne-based architectural and urban design practice, McGauran Giannini Soon Architects (MGS).

Graduating from the University of Tasmania with a Master of Architecture (First Class Honours) in 2010, Sam was awarthe 2011 BlueScope Steel Glenn Murcutt Student Prize

CONTENTS **ISSUE 111**

COVER PROJECT
Florida Beach House

PHOTOGRAPHER
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ARCHITECT Iredale Pedersen Hook
PROJECT Florida Beach House
LOCATION Mandurah, Western Australia

BETWEEN SEA AND SKY

Perched on a sand dune overlooking the Indian Ocean, the pitched and folding roof of this beach house by Iredale Pedersen Hook evokes the sea and sets it apart from its neighbours.

Words **Alex Taylor** Photography **Peter Bennetts**

5

Everything about this house at Florida Beach near Mandurah (70km south of Perth) speaks of its oceanfront setting: the recycled jarrah platform that allows the house to hover above the dunes, the large expanses of floor-to-ceiling glazing that offer direct and filtered views of the waves and sky from most rooms, and the undulating roof that conjures up images of rolling swell.

"The clients' brief was simple: it's a holiday house, so basically they wanted to be able to leave Perth, without packing much, drive for just over an hour and step into a house where they could relax," Adrian Iredale says. "They wanted it to be made of durable and quality materials that wouldn't need much maintenance, which would enhance their pleasure in being by the coast."

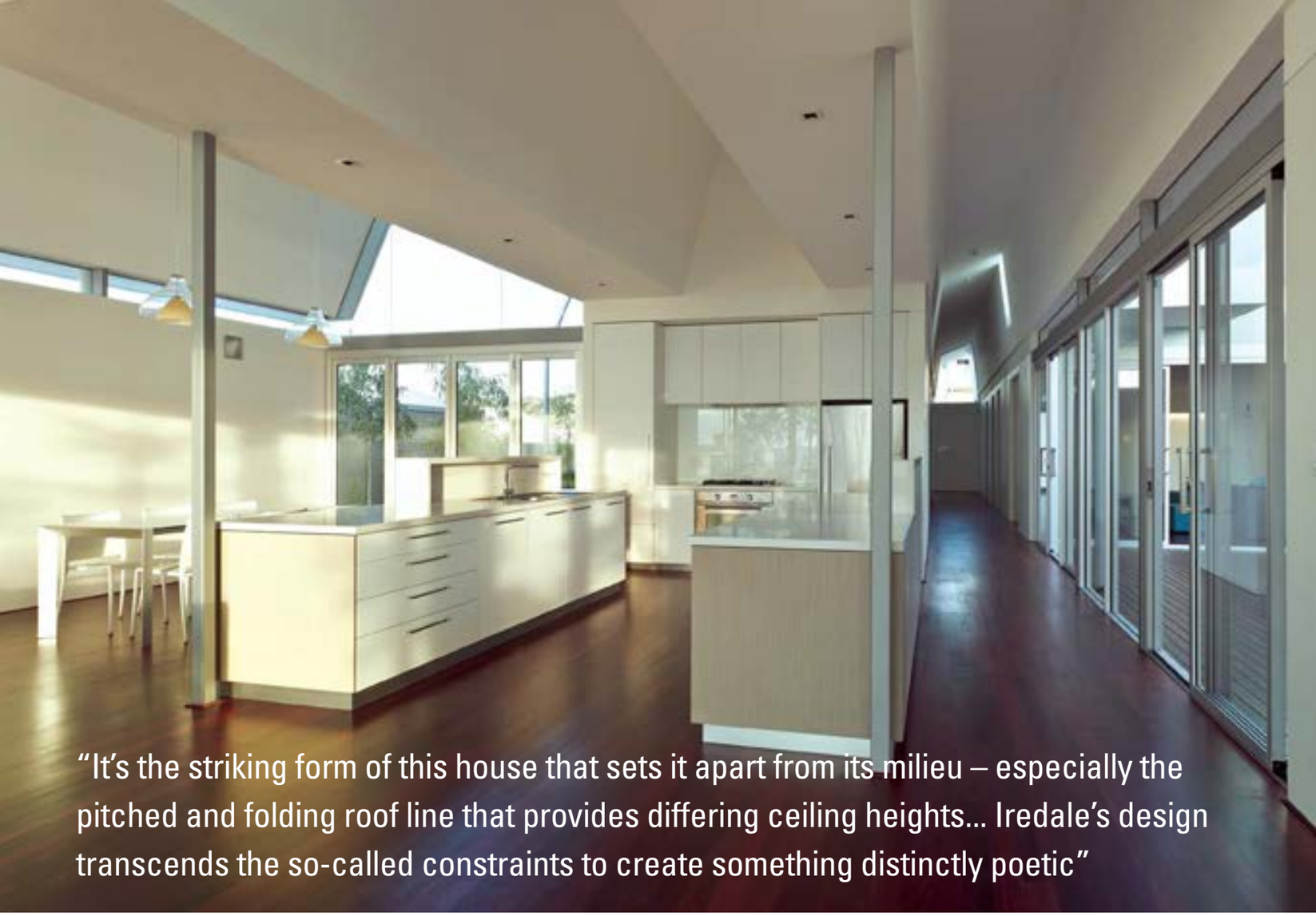
And while they wanted to maximise their visual connection to the ocean, both client and architect were aware of the need to protect indoor and outdoor spaces from the unforgiving, low western sun which is "unbearable in summer", Iredale says, and the Fremantle Doctor winds which blow in from the south-west most days, making coast-side decks unusable.

"They showed me images of a project with courtyards where you could sit outside and dine, and look through the house and filtered trees to ocean views," Iredale says. "We decided to use landscaping between the house and the ocean to filter that low western sun."

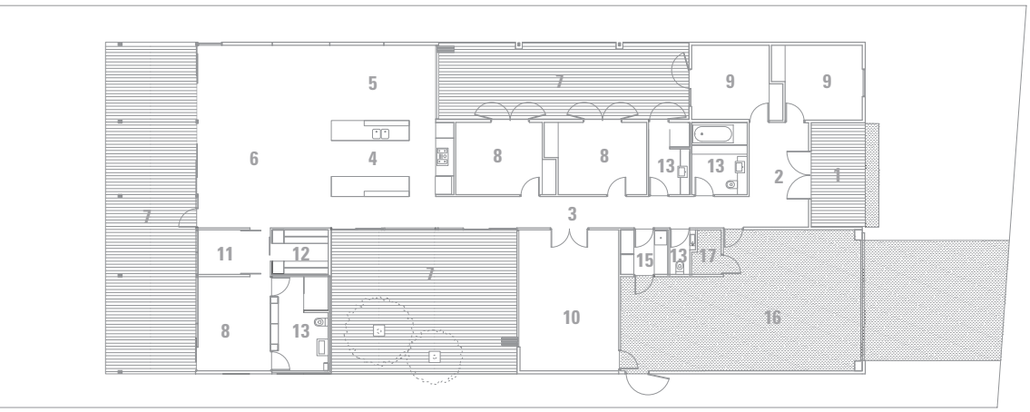
Iredale's sensitive and considered approach to these issues sets the house apart from the neighbours, both old and new. The earliest houses at Florida Beach – which occupies a spit of land between the Indian Ocean and the Peel Harvey Estuary, near the man-made Dawesville Cut which connects the two – were modest fibro-clad shacks. These often accommodated entire families who migrated south from Perth for extended periods over the summer months; in recent times they have started to be replaced by suburban sprawl, and commuters creeping south from the capital city.

This site is part of a new subdivision which was cleared of vegetation and graded to nearly level by its developer to create tabula rasa building blocks. The accompanying set of covenants seemed more than likely to result in a streetscape of non-descript, ordinary houses and, by and large, that's what has happened in this stunning seaside locale. Despite these constraints, or indeed, because of them, Iredale was determined to imbue this house with its own character – uniquely shaped by the place and its proximity to the ocean. ↗

Iredale was determined to imbue this house with its own character – uniquely shaped by the place and its proximity to the ocean



"It's the striking form of this house that sets it apart from its milieu – especially the pitched and folding roof line that provides differing ceiling heights... Iredale's design transcends the so-called constraints to create something distinctly poetic"

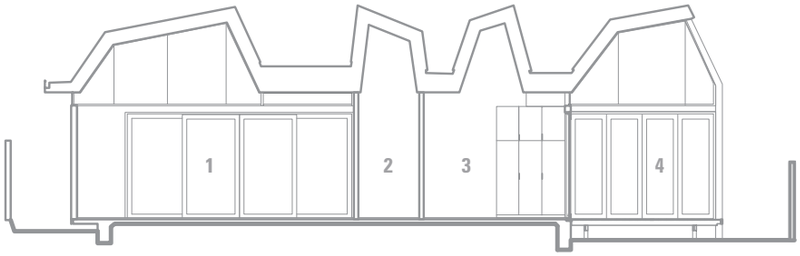


LEGEND

1. Entry patio
2. Entry
3. Hall/Gallery
4. Kitchen
5. Dining
6. Living
7. Patio
8. Bedroom
9. Guest bedroom
10. Games room
11. Study
12. WIR
13. Bathroom
14. WC
15. Laundry
16. Garage
17. Store

BELOW LEFT: The master bedroom holds views towards the ocean BELOW RIGHT: Ribbons of glass that offer views of the sky expand and contract to fill in the spaces beneath the undulating steel roof, as seen here in the master ensuite

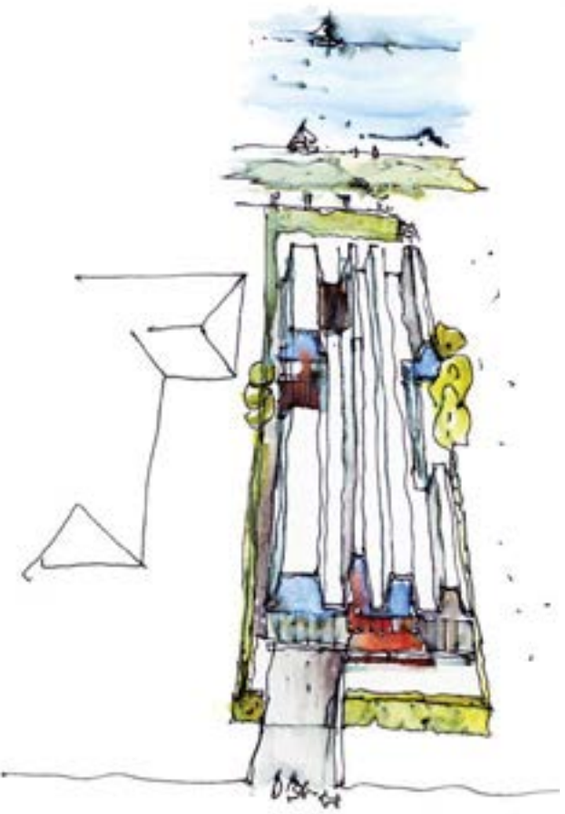
LEGEND
1. Games Room
2. Hall
3. Bedroom
4. Patio



SECTION

BELOW: Courtyards on the northern and southern sides mean that the rooms closest to the street benefit from borrowed views thanks to expansive glazing and the open-plan living area at the western end

SOUTH ELEVATION



The covenants dictated that houses on the ocean side of the street had to be single storey and no taller than approximately 5m, with a roof pitch of 25 degrees. These conditions shaped Iredale's initial response. His palette of materials was also inspired by local influences: the steel columns and roof made from COLORBOND® steel, glass and compressed fibre-cement walls, and timber platform and frame are reminiscent of the 1950s and '60s beach shacks with their simple, utilitarian and low-maintenance aesthetic.

However, it's the striking form of this house that sets it apart from its milieu – especially the pitched and folding roof line that provides differing ceiling heights across four internal bays, and infuses each room with its own individual character. Iredale's design actually transcends the so-called constraints to create something distinctly poetic.

Iredale intended that these internal vaulted spaces – which retain their domestic scale despite some having 4.5m-high ceilings – would encourage the owners and their guests to appreciate the ocean views, so that they would never become stale or unappreciated. In this, he was partly inspired by Danish architect Jørn Utzon, whose sketch of Danes huddled on a beach under glowering clouds described the concept for the soaring roof at the Bagsværd Church (designed 1968, completed 1976).

"Utzon was trying to observe and capture the way in which people congregate on the beach, under dense rolling clouds, and translate that into a poetic internal expression for the church through the use of concrete, cloisters and courtyards," Iredale says. "We took inspiration from Utzon and transformed it into our own version."

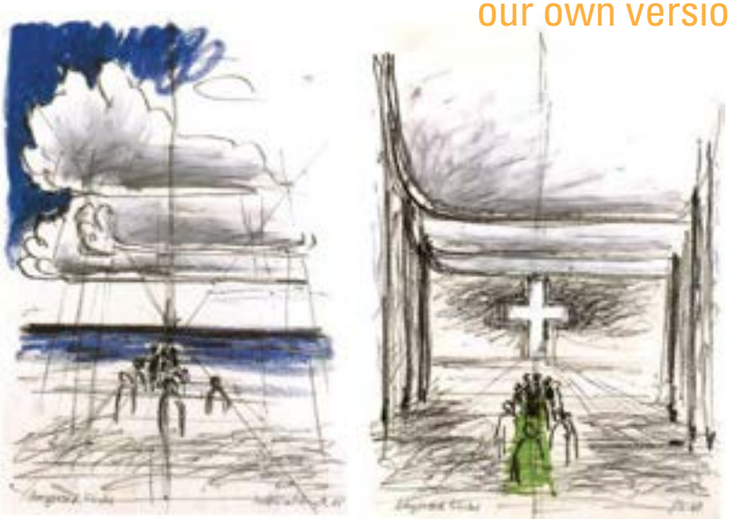
By running the overstated corrugations of the roof between the street and the ocean, rather than across the site in a continuation of the sea's waves, the design intentionally focuses the eye towards the view from the moment one crosses the threshold at the eastern end. The linear nature of the plan – with courtyards on the northern and southern sides – means that the rooms closest to the street benefit from borrowed views thanks to expansive glazing and the open-plan living area at the western end.

The design also provides a sense of privacy and isolation from the street and adjacent neighbours thanks to 2.7m-high CFC and plywood walls along the northern and southern elevations. These are topped by a 30cm ribbon of glazing that brings in natural light and offers glimpses of the sky in every room, in addition to the windows and doors that open on to various sheltered courtyards. At the eastern and western ends, and around these internal courtyards, these ribbons expand and contract to fill in the spaces beneath the undulating steel roof.

Utzon translated the way people congregate on the beach, under dense rolling clouds, into a poetic internal expression for the church… We took inspiration from Utzon and transformed it into our own version

PANEL SAYS

This is a very skilful design that takes delight in its undulating roof form, which allows it to sit proudly and dominate the unique surrounding landscape. This playful roof at first appears heavy from the outside, but this effect is tactfully contradicted by the use of inconspicuous steel columns, found internally within the main living space and externally on the oceanfront deck. These slender steel columns lend a rhythm to the building and are integrated within the floor plan to create a harmony with the roofscape, the pitched and folding form of which helps to blur the boundaries between inside and out. We particularly admire the series of sketch diagrams that express the complexity of this design as well as the images taken from the beach, which indicate that this is a bold architectural statement against a backdrop of fairly banal suburban-type housing.



TOP LEFT: Concept sketches by Adrian Iredale, who intended that the internal vaulted spaces would encourage the owners and their guests to always appreciate the ocean views

ABOVE: Iredale was partly inspired by Danish architect Jørn Utzon, whose sketch of Danes huddled on a beach under glowering clouds described the concept for the soaring roof at the Bagsværd Church

From the street, one can observe the composition of hovering platform, ribbons of glass and vaulted roof bays, which combine to set this house apart from its neighbours

"Being a weekend destination, our clients were conscious of not having the same amenity as a city-based house, so that meant being able to open the doors and windows to prevailing breezes, and having a different exposure to light," Iredale says. "By having a roof that floats above the walls with glass all the way around, they have an exposure to the outside that they wouldn't have in Perth; they are more part of the elements here and can appreciate different qualities and sun patterns as they change throughout the day and the year."

The wave-like roof is clad with Fielders Spanform made from COLORBOND® Ultra steel in the colour Surfmist®, which was deliberately selected for its "obvious and exaggerated profile", Iredale says. "It also provides a twist on the suburban nature of the area, and contrasts with the surrounding project homes," he adds.

The weighty appearance of the roof is juxtaposed against the lightness of its visible supports – two fine SHS steel columns in the living room and four more outside on the western deck. "We limited the use of exposed steel because of airborne salts and the harshness of the environment, but the steel columns used in these locations are a celebration of the material because they are so slender," Iredale says.

"We have a big heavy roof that is essentially floated on quite small columns to create a purposeful imbalance," he adds. "It fits with our notion of creating a dynamic situation between the ocean and the occupants through a combination of tension and serenity. We wanted to encourage a range of experiences in this project."

Because of the home's proximity to Perth, much of the construction was manufactured in the capital in grid-like sections – the dimensions of which were dictated by off-the-shelf products – prior to being assembled on site. "All of the steel framing was pre-made to size, to minimise welding and cutting on site and to maximise its longevity in the coastal environment," Iredale says. "The steel was then painted with a two-pac epoxy paint to protect it."

The efficiencies achieved through partial prefabrication made it a relatively inexpensive project to build, Iredale says. "Considering the complexity of the design, the structure itself is simple," he explains. "A lot of our projects tend to be economical to build even though they contain complex systems, and this house feels and looks a lot more complicated than it is.

"When we design and document a project, we meet with our preferred builder from the outset; that's one of our primary ways of realising complex projects within standard budgets," he continues. "We learned from our earliest projects that you can do a lot more with a modest budget by working closely with the industry – such as consulting engineers and tradespeople – from an early stage, because architecture is a collaborative process."

That early engagement combined with Iredale's careful interrogation of the site and in-depth exploration of issues surrounding coastal living have produced an "inspirational" house, according to the WA Australian Institute of Architects Jury, which awarded Iredale Pedersen Hook with the state's highest accolade for single houses in 2011. Despite having built many striking homes that have attracted attention both in Australia and overseas, this is the first time since the firm's inception that it has won the Marshal Clifton Award for Residential Architecture – Houses.

"The carefully articulated plan form provides connection to the ocean from deep within the site, while the roof forms at once delineate spaces and offer a beautifully lit path from entry to the major communal areas – both internal and external – that overlook the dune landscape and the beach," the Jury said in its statement.

For his part, Iredale says, the house enables its occupants to experience a sense of wonderment at the constantly shifting natural environment, all day long. "From my brief experience of staying there, you wake up with the sunrise coming through eastern windows, and experience the movement of the sun throughout the entire day," he says. "You can even see the sun setting and the moon rising at the same time. The house provides an opportunity to interact with the ever-changing landscape, and that – combined with the movement and changes that occur in the ocean – creates a dynamic engagement with place." **SP**

PROJECT Florida Beach House **ARCHITECT** Iredale Pedersen Hook **PROJECT TEAM** Adrian Iredale, Finn Pedersen, Martyn Hook **PROJECT ARCHITECT ADMINISTRATION** Jemma Vandongen **PROJECT DESIGN AND DOCUMENTATION** David Barr, Giancarlo Belviso, Kylene Tan **STRUCTURAL & CIVIL ENGINEER** Scott Smalley and Bill Butler **BUILDER** A.T. Brine & Sons **LANDSCAPE ARCHITECTS** Crispy Edges **PRINCIPAL STEEL COMPONENTS** Roofing: Fielders Spanform made from COLORBOND® Ultra steel in the colour Surfmist®; Fascias, flashings, gutters and downpipes made from COLORBOND® Ultra steel in the colour Surfmist®; Structural: Hot-dipped, galvanised and painted SHS and RHS **PROJECT TIMEFRAME** Design: one year; Construction: two years **AWARDS** The Marshall Clifton Award for Residential Architecture – Houses; Commendation, Interior Architecture, WA Australian Institute of Architects Architecture Awards 2011; High Commendation, 2011 Houses Magazine Awards for New Houses over 200m^2; Commendation for Residential Interior Spaces, DIA WA Awards 2011 **BUILDING SIZE** Floor area (including decks): 520m^2

NONDA KATSALIDIS

RIC WALLIS

LEADING THE WAY

A new prefabricated steel building system – designed by Melbourne-based architect Nonda Katsalidis – aims to revolutionise offsite construction in Australia, and is already delivering significant benefits. Words **Rachael Bernstone** Photography **Ric Wallis (portrait)**

With four projects complete and more in the pipeline, the recently unveiled Unitised Building system is already delivering on its promise of reducing construction risks and cutting construction timeframes thanks to the controlled factory conditions that remove many of the variables in the delivery cycle.

The system was designed by Melbourne-based architect Nonda Katsalidis – of Fender Katsalidis Architects – whose signature projects include the city's tallest building, Eureka Tower, and the stunning new Museum of Old and New Art (MONA) in Hobart. It is one of several projects Katsalidis has completed for client, friend and art patron David Walsh at Moorilla Estate, and features innovative steel elements, including the distinctive weathering steel-clad fortress-like turrets that front the Derwent River.

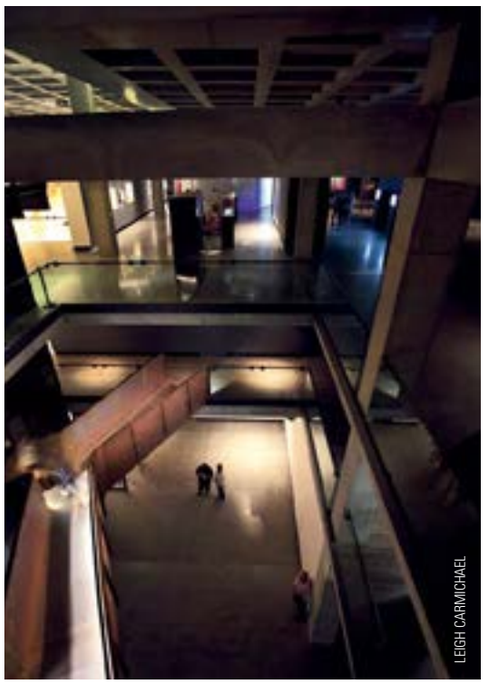
The museum's main entrance is clad in a stainless steel box that creates a "Tardis-like effect" by disguising the Roy Grounds-designed courtyard house that sits behind it. On the lowest level of the museum, which is excavated deep into the sandstone hillside, a massive steel beam soars overhead between the circular staircase and lift shaft, and the underground bar. "I wanted a lightweight truss which would have been cheaper, and more importantly, manoeuvrable, but David wanted a bigger piece of steel so we needed a Trojan-style trestle to put it into place," Katsalidis says. "But it's a very nice feature, in the end."

Elsewhere in the gallery – for example the twisting weathering steel staircase that connects two lower floors and the eight pavilions named after famous Australian architects, which provide boutique accommodation onsite – steel fulfils important aesthetic and functional roles.

Katsalidis is also known for his work on several of Melbourne's most lauded apartment buildings, including Melbourne Terrace (1994) – which is credited with kick-starting a residential renaissance in the city's CBD – and Hero in Russell Street (2002), which features a distinctive weathering steel addition on the roof that helped breathe new life into a former telephone exchange and post office.

In recent times, Katsalidis has been recognised by his peers and the community for the quality of his skyscrapers, including the 100m-high Republic Tower (2001) at the corner of Queen and LaTrobe Streets – which critic Norman Day said was "probably the best high-rise architecture to erupt in Kennett Town" – as well as the multi award-winning 90-storey Eureka Tower (2006), designed with partner Karl Fender.

In awarding that project the National Australian Institute of Architects Harry Seidler Award for Commercial Building in 2007, the jury said:



ABOVE: Hobart's Museum of Old and New Art (MONA) features an internal stair made of weathering steel

BELOW: MONA, at dawn

Images courtesy of MONA Museum of Old and New Art, Hobart, Tasmania, Australia

1. Four of the MONA Pavilions named after famous architects: Roy, Robin, Esmond and Walter. Designed in 2008 by Nonda Katsalidis in association with the Antarctica Group
2. Melbourne's tallest building – the 300m high Eureka Tower – was designed by Fender Katsalidis Architects and completed in 2006
3. MONA's Esmond Pavilion was named after influential Tasmanian architect James Henry Esmond Dorney
4. Republic Tower in Melbourne was completed by FKA in 2001
5. Craning a Little Hero apartment module on to site in Melbourne's Russell Place
6. Little Hero contains 63 one- and two-bedroom apartments, whose modules were installed onsite in just 10 days
7. Melbourne Terrace was completed in 1994, and is credited with kick-starting a residential renaissance in the CBD
8. UB's second project – The Nicholson in East Coburg – was designed by DesignInc and completed in August 2011

"The value of the design is clearly evident in the way the tower has already embedded itself into the mental map of the city of Melbourne, and it provides a vivid reminder of the powerful character of the metropolis and the metropolitan space in which Australians are increasingly choosing to live."

The Unitised Building (UB) system combines Katsalidis' expertise in delivering high-quality design that works both at a human scale – resulting in rooms that are a delight to inhabit – and at a civic scale – contributing a sense of presence to the streetscape and neighbourhood. UB is a modular system that manufactures apartment-sized units in a factory in Melbourne's western suburbs, which are then transported to site for installation and assembly. The system can be deployed by any architect to deliver projects such as hotels, apartment buildings, student accommodation and hospitals.

While the cost of building with UB is similar to conventional construction methods, the system offers several distinct advantages, Katsalidis says. "We are able to build in a more controlled environment, so the quality and precision is better, and we have a dedicated workforce who know what they are doing," he explains. "The process is more predictable and reduces construction risk, as we are not exposed to the weather, and we are able to control wastage and therefore improve efficiency. That means the costs are similar but the building delivery is more predictable which is resulting in construction times half of what you would normally expect."

The first UB project was completed in July 2010 and was designed by Katsalidis himself. The eight-storey Little Hero apartment building in Melbourne's Russell Place comprises 63 one- and two-bedroom apartments sitting above ground-floor retail, cafes and restaurants. It was completed in nine months – with installation of the modules taking just 10 days, and residents moving in just four weeks after their installation – delivering a six-month time saving in comparison with conventional building techniques.

Little Hero resident Anna Parle says the building is like an oasis in the heart of the city. "It combines beautiful architecture with environmentally sustainable design offering me the best of both worlds: inner city living without compromising on space or quality," she says.

The modular offsite method of construction also helped to avoid many of the pitfalls associated with building in the city, such as difficult access, noise and pollution disruptions for neighbours, and safety issues that arise from working with heights.

"Structural steel is lighter... so we are able to build significantly bigger structures that can be transported"

At current production levels, the UB factory in Brooklyn – which employs 200 people – is capable of producing 2,000 apartments a year. Workplace conditions are superior and there is consequently greater employee diversity than might be found on traditional building sites, Katsalidis says. "UB represents improved conditions for construction workers because they aren't working at heights, they don't need to wear hard hats, there are more opportunities for women, and it is a great training ground for apprentices," he says. "The prefabrication system also reduces waste and delays because we are not subject to the weather; we can run the factory 24 hours if need be, so we can catch up or adjust our schedules if circumstances demand it."

Katsalidis chose steel as the basis for the UB system for its light weight and ease of transport – it results in structures that weigh up to 60 per cent less than their concrete counterparts – and for the fact that the system can incorporate recycled materials and be recycled itself.

"Structural steel is lighter than concrete so we are able to build significantly bigger structures that can be transported," he says. "We can transport objects that are four to five times bigger than those made of concrete, and they are completely finished. That's the key to making prefab work."

Katsalidis asserts that despite 40 years of experimentation and innovation in prefabrication techniques, the construction industry hasn't yet wholeheartedly embraced parallel offsite and onsite construction. He says that UB – a monocoque system where the structure, internal walls, external walls and connecting columns are all made from steel – aims to change that.

The second project to be completed using UB – The Nicholson in East Coburg – was designed by DesignInc for the state government development agency, VicUrban, and completed in August 2011. The handover was three months later than the original projected timeframe, a delay caused by excessively wet weather conditions which impacted onsite construction processes, Katsalidis says. "We've had one of the wettest winters in Melbourne in about 15 years, which delayed the works for the car park and ground-level retail onsite," he says. "We didn't have any delays in the factory at all."

One of the reasons VicUrban chose the previously unproven UB system to construct the mix of 200 public and private apartments – which have been privately sold and leased to public tenants under the National Rental Affordable Housing Scheme – was for its sustainability credentials. The apartments come with a six-star energy rating thanks to passive solar design, onsite grey water treatment, solar gas-boosted hot water and drought resistant landscaping. The lower embodied energy and reduced waste generated by the modular construction method were also key selling attributes.

Private developers built the third and fourth UB projects – Centvm apartments designed by BBP Architects in Plenty, and Pegasus apartments designed by Katsalidis in Mitcham, respectively. Katsalidis has plans to take UB interstate in future, initially by transporting modules made in Melbourne to other states, with a view to eventually establishing factories in both New South Wales and Queensland.

While the industry's uptake has been somewhat cautious to date – "like any new technology it takes a while for it to catch on," Katsalidis says – he is confident UB is "the way of the future". Given its advantages over conventional construction, and the completed projects that prove the system works as promised, he may well be right. SP


JOHN GOLLINGS 7

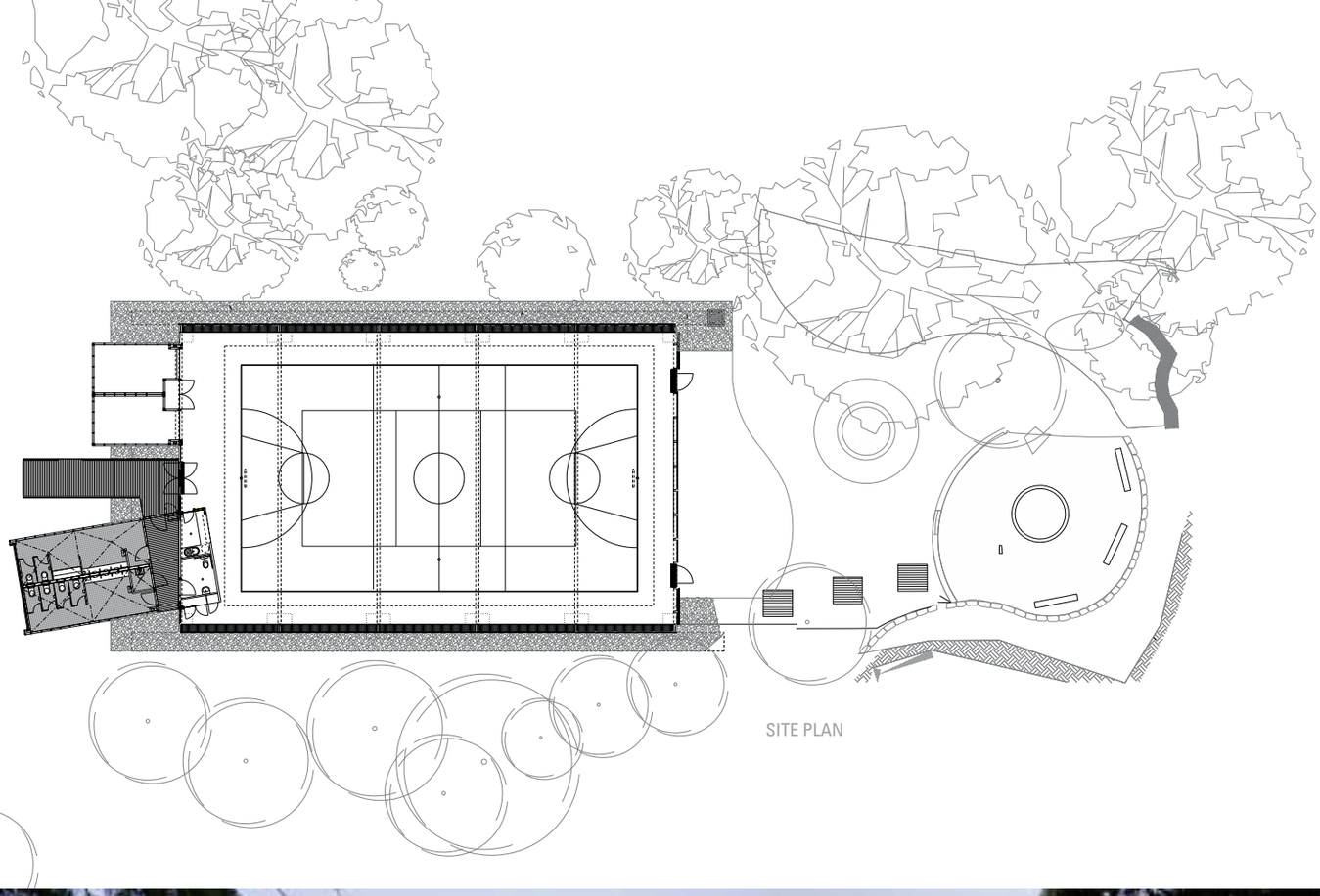

8 KATARINA STUEBE

KINDERS' SURPRISE

Commissioned on a typically tight budget, Allen Jack+Cottier has created a clever and responsive recreation hall for school children that serves its occupants and site exceedingly well.

Words **Rob Gillam** Photography **Allen Jack+Cottier**

ARCHITECT Allen Jack+Cottier
PROJECT Milson Island Sport and Recreation Centre
LOCATION Hawkesbury River, Brooklyn, New South Wales



SITE PLAN

Located midstream in the picturesque Hawkesbury River near Brooklyn, New South Wales, Milson Island has been used at various times over the last century as a hospital and jail, but is now a playground for primary school children. The client, Sport and Recreation New South Wales, hosts groups of up to 180 kids at a time who 'camp' there for a week and enjoy activities such as canoeing, fencing, climbing and high ropes.

When faced with an ordinary budget it is easy enough to turn out a commensurately ordinary building, however Allen Jack+Cottier principal Michael Heenan considered the commission an opportunity to demonstrate that great things can be done with limited resources. "The client had quite limited funding, but high expectations," Heenan says. "It's good working with clients who expect grand results. We like a challenge; it encourages us, and fortunately we know some ways to save money by working smarter."

Cost savings were especially important given all materials were barged to the island. "We couldn't just truck onto site so our material selection was dictated to some degree," Heenan says. "We did investigate the possibility of using materials other than steel. We modelled some different materials but nothing could match steel's contributive strength and lightness, so it was an ideal choice given our building constraints."

Heenan points out that the steel purlin lengths were designed to match their intended mode of transport. "It was no coincidence that they are 6.7 metres, which is the length of *Miss Piggy*, the barge which took them there," he says. "Those short pieces clipped together very easily to form the building's frame. Once they were bolted together they regained their engineered properties to form slender 600mm-deep by 21-metre-wide spans, which is quite phenomenal. Steel makes it easy to do junctions like that."

Heenan took a 'first principles' approach in which structural and cladding materials combine. An acoustically optimised mod wood ceiling topped in insulation and finished in LYSAGHT CUSTOM ORB® made from COLORBOND® Ultra steel in the colour Dune® integrates with the steel structural bracing.

This structural modelling allows the specifically shaped walls and ceiling to carry the building's wind loads. "We unloaded the necessary structural capacity of the building by about 30 per cent, which also made it between 25 and 30 per cent less costly," Heenan says.

He adds that the decision to use LYSAGHT CUSTOM ORB® made from COLORBOND® Ultra steel for exterior cladding was a simple one: "There's a lot of information to assist the industry in product selection these days. Pre-rolling COLORBOND® is a standard thing now; you just order it at the radius you want," he says. "Due to proximity to the water we chose COLORBOND® Ultra steel."

With the cladding's suitability in the marine environment established, was there a concern about selecting structural steel? "No, paint systems are so sophisticated these days that it's almost getting to the point where we are not galvanising as much," he explains. "The specialised paint system we're using would stand up to being right on the ocean. Even oil rigs are made out of painted steel these days."

"Nothing could match steel's contributive strength and lightness, so it was an ideal choice given our building constraints"

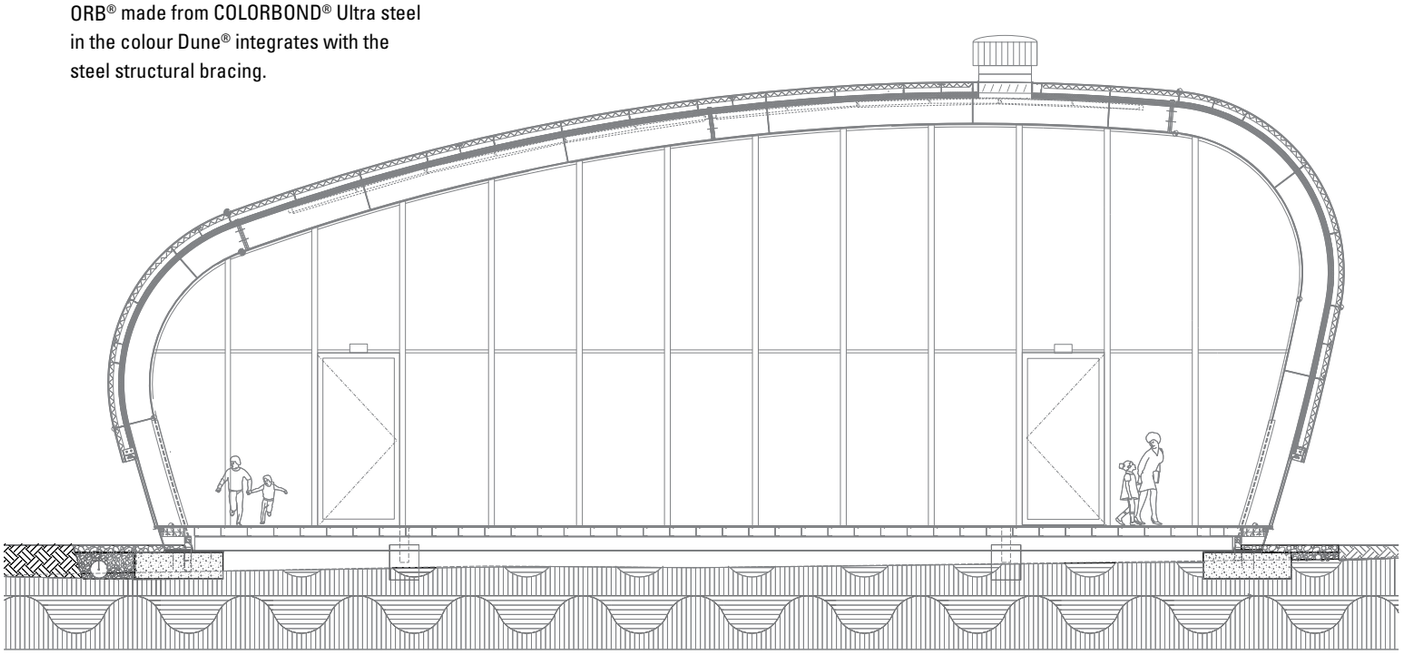
The building's roof design forms a protective shell, wrapping the entire building. The roof extends towards the ground, stopping short 1.3 metres from the floor, and acts as a fire-deterrent skin. The roof shape also deflects tree debris, which collects on the ground alongside an in-ground rainwater gutter that lies beneath a filtering stone garden. The design's integration of the roof and walls without traditional gutters was enough to extinguish fire hazard concerns, and the hall nestles deeply into a thick clump of trees.

End-wall wind bracing made up of floor-to-ceiling steel rectangular hollow sections is visually unobtrusive. The roof cantilever on the northern end is a neat touch, acting as a proscenium arch for the children to play out their evenings amidst the inviting glow of an impressive fire pit.

To his credit, Heenan allowed the hall's purpose to shape his vision for its design. "When I came here I had no idea the building would turn out like it has," he says. "There was nothing preconceived about it. It has been generated from its place and that's what I like about it. But it shouldn't be about what *I* like. It should be about its functionality for the kids. We're not going to be here for the next 40 years but kids will be, so ultimately it has to be relevant and responsive for them."

The hall's semi-eliptical shape was born of the breeze. Thermodynamic analysis revealed that the channel carved through the spectacular sheer rock faces by the Hawkesbury River bends the breeze up and over the island. "We found a predominant breeze direction, so we designed the building shape to react to this more constant breeze," Heenan says. "Specifically, we knew we had the opportunity to harness it for natural ventilation."

It's no accident that the roof has a wing-like shape: "a wing gives lift, which is suction in our application," Heenan explains. "This suction draws hot air out of the building through the roof turbines to create an internal cooling effect when the turbines are opened in tandem with the electronically controlled low-level louvres, which run along the entire building length. Before entering the building, the low-level air is drawn across large river stones which are kept shaded and moist, thus enhancing the cooling effect."



SECTION

The architect took a piece of roofing made from COLORBOND® steel in the colour Dune® to site and discovered it matched the bark colours and the camouflaged patterns cast by the shadows of the surrounding trees

Not only is the building's form an overt expression of thermodynamic modelling, it's also a response to more material surroundings. In order to camouflage it from the adjacent Milson's Passage residents, Heenan pushed hard to place the hall amongst bushland rather than in a clearing. "The residents wrote us a letter saying they appreciated how sensitively we had designed and sited the building so that the bushscape remained unspoiled."

Heenan also deliberated at length on an appropriate colour for the exterior cladding. "There was a push to make it a dark colour but we knew a lighter one would be less obtrusive in the landscape," he says. "The bark of the surrounding trees creates a pattern as it peels and, being quite silvery, matches well with the Dune® colour.

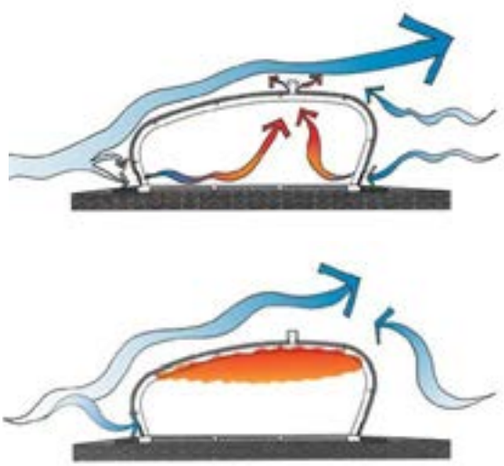
"It took me a while to be 100 per cent sure, but when I took a sample piece of the COLORBOND® steel to the site I noticed that the trees cast shadows on it that would mimic the bark patterns and also create a camouflage pattern on the building."

Heenan found it ironic that his ellipse-like hall has sometimes been referred to as the 'wonky' shed.

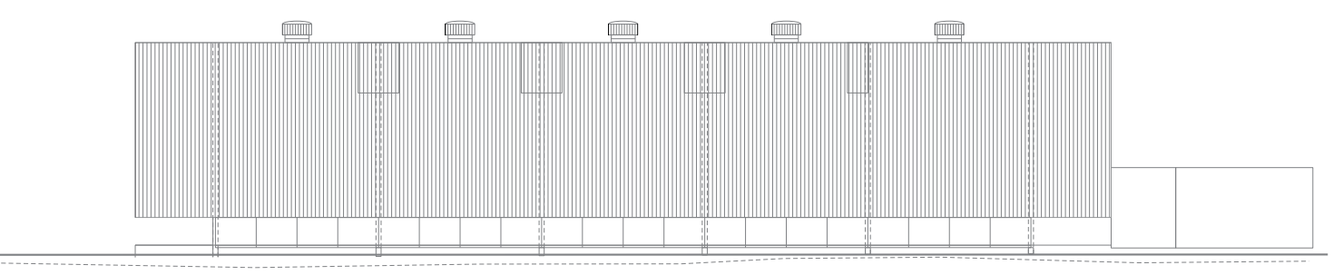
"There's a lot of thinking and a lot of scientific modelling behind this thing," he says. "With the capabilities of steel, we got over the issues of span pretty quickly. We're about trying to create architecture, not straight buildings, so we then started thinking poetically about the shape."

In addition to the wind influencing the hall's design, it also takes cues from the vast river surrounds in which it 'floats' like a marine vessel. "The building's shape is almost like a boat's hull in reverse. Someone joked that we could have built it on shore and floated it over upside down," laughs Heenan.

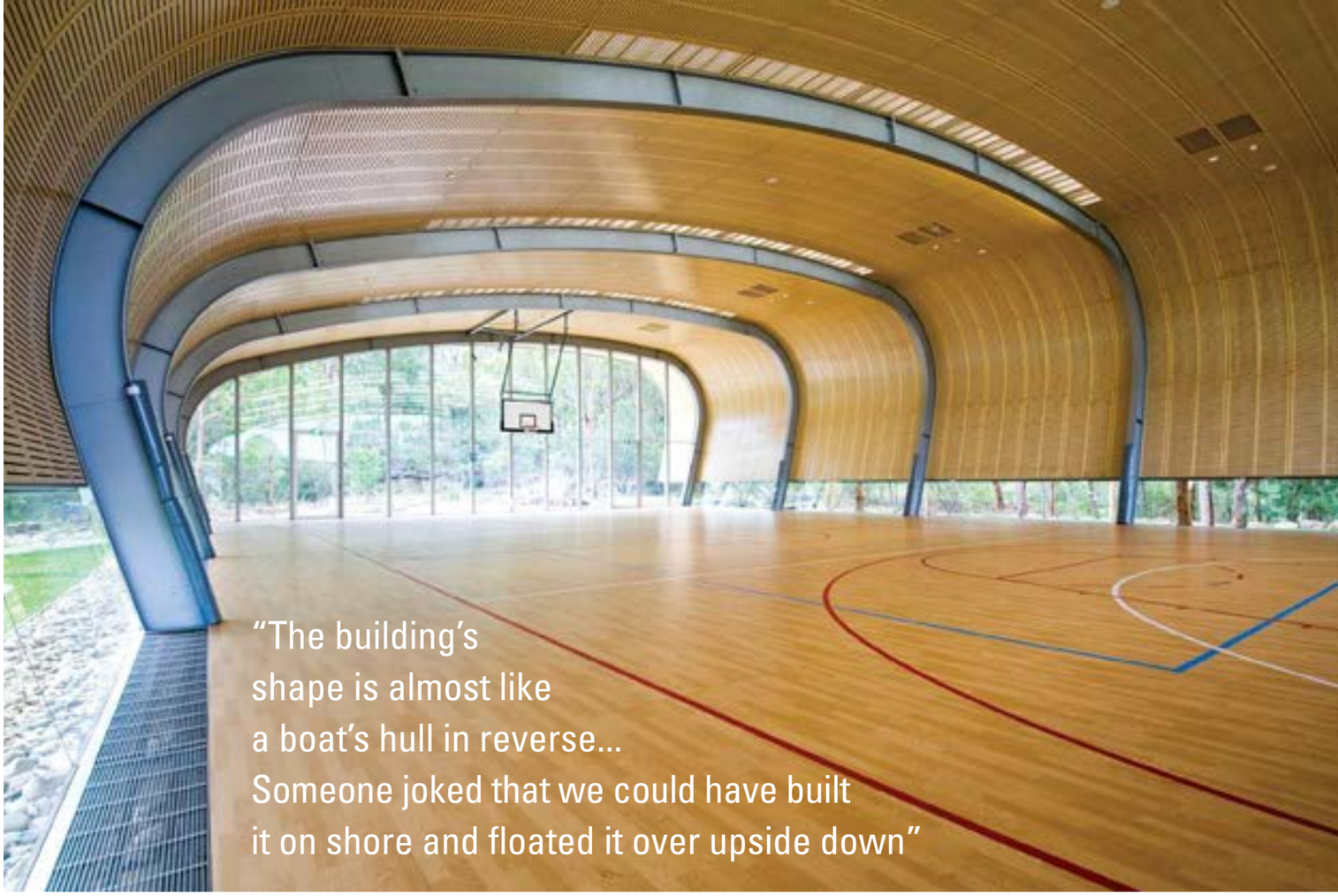
"I was quite struck by images of Arnhem Land canoes made out of tree bark, which are braced with sticks, and also the way canoes are used upside down as land shelter – one side being propped up and the other touching the ground," he says. "This project shares design similarities in the way it responds to the predominant western breeze. I tried to reflectthe essence of shelter, the simple poetry of a piece of bark leaning on the ground: it's just that our 'sticks' happen to be steel." **SP**



ABOVE: The building's wing-like shape harnesses a predominant breeze direction. Electronically controlled louvers work in tandem with roof turbines to provide natural ventilation



WEST ELEVATION

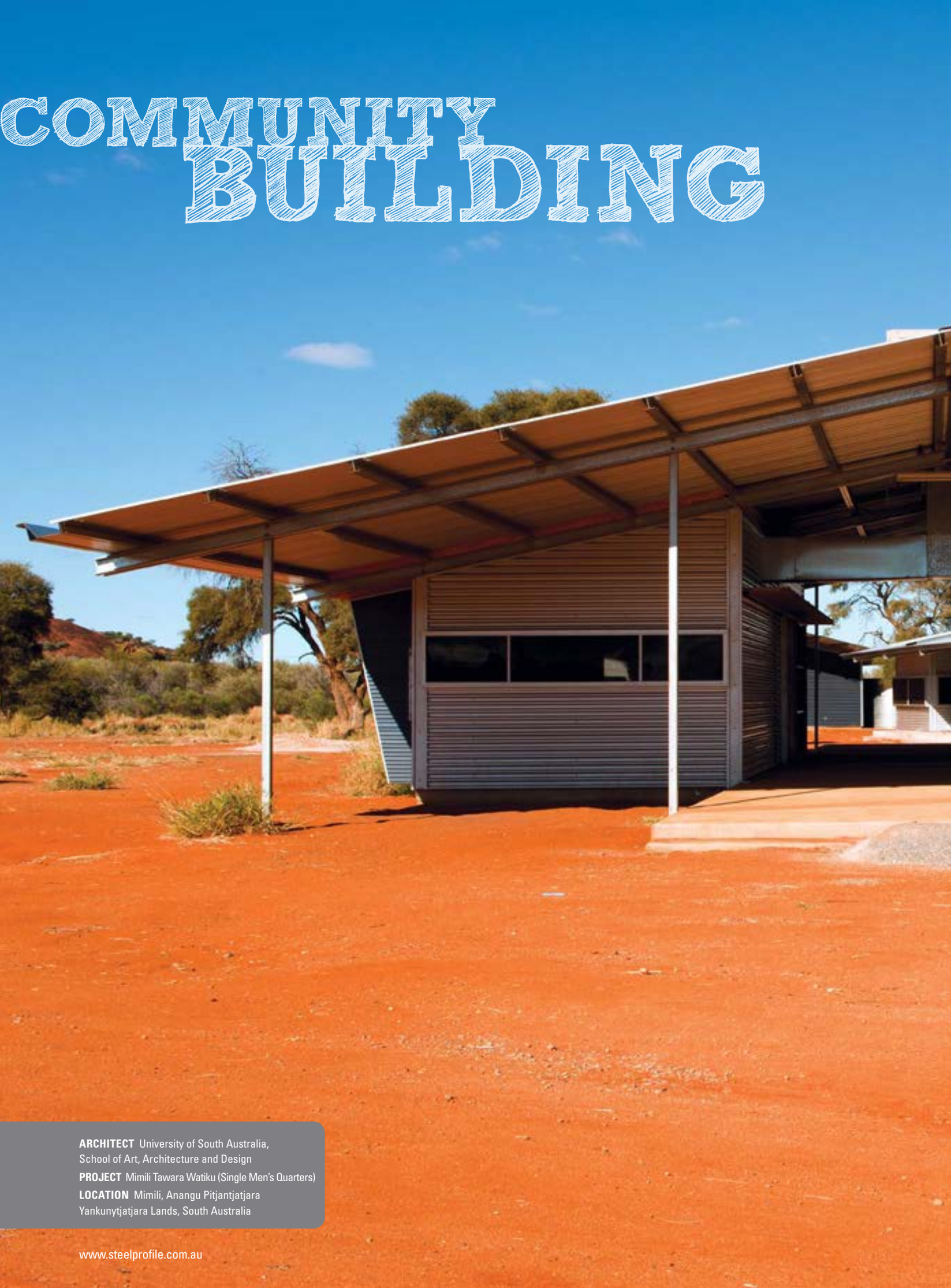


TOP: Steel purlins were barged to the island in 6.7-metre lengths then clipped together into slender, yet enormous, spans that provide tremendous contributive strength

BOTTOM: The roof cantilever acts as a proscenium arch, against which the children play out their gatherings

PROJECT Milson Island Sport and Recreation Centre **CLIENT** Sport and Recreation New South Wales **ARCHITECT** Allen Jack+Cottier **PROJECT TEAM** Design: Michael Heenan; Project Director: John Whittingham; Project Architect: John Gunnell; Architect: Jennifer Gerbauer **STRUCTURAL ENGINEER** Taylor Thomson Whitting **BUILDER** Inten Constructions **STEEL FABRICATOR** Designed Building Systems **SHOP DRAWING CONTRACTOR** Centreline Drawing Services **CLADDING CONTRACTOR** Sam’s Roofing **LANDSCAPE ARCHITECTS** Environmental Partnership **PRINCIPAL STEEL COMPONENTS** Roofing: LYSAGHT CUSTOM ORB® made from COLORBOND® Ultra steel in the colour Dune®; Structural steel with Ferrador paint system **PROJECT TIMEFRAME** March 2010 to November 2010 **AWARDS** 2011 Master Builders National Excellence in Building and Construction Awards: National Commercial / Industrial Construction Award – under $5 million; 2011 Australian Institute of Architects New South Wales Design Excellence Awards – Commendation **BUILDING SIZE** 690m² (floor area) **TOTAL PROJECT COST** $2.7 million

COMMUNITY BUILDING



ARCHITECT University of South Australia, School of Art, Architecture and Design

PROJECT Mimili Tawara Watiku (Single Men's Quarters)

LOCATION Mimili, Anangu Pitjantjatjara Yankunytjatjara Lands, South Australia

Delivering a new type of housing for a remote Aboriginal community posed a unique set of challenges for the University of South Australia's student design and construction program. Words **Rachael Bernstone** Photography **CJ Taylor, James Tylor**

23

Having previously built a visitors shelter at Patjarr in Western Australia's Gibson Desert and another at Mt Franklin National Park in the ACT (*Steel Profile* #105), the team from University of South Australia, School of Art, Architecture and Design (UniSA), was prepared for its challenges – offsite prefabrication and remote onsite construction, a largely novice workforce and difficulties associated with extreme climatic conditions – but this project at the remote South Australian Aboriginal community of Mimili was the toughest one yet. The innovative nature of the housing type, the large number of stakeholders involved in its delivery, and the project's scale combined to set it apart from earlier ventures.

Mimili Tawara Watiku grew out of the Patjarr project (completed in 2003), when UniSA senior lecturer in architecture David Morris and his colleague Dr Gini Lee embarked on an Australian Housing and Urban Research Institute (AHURI)-funded study that examined best practice models for cross-cultural consultation, focused on improving the built environments of remote Indigenous communities.

"Working at Patjarr gave me my first opportunity to see a remote Aboriginal community in terms of its housing and planning," Morris says. "The Patjarr people were very close to their traditional culture, and in such a remote place I questioned whether planning preferences for street frontages and other suburban conventions were appropriate."

Their research took Morris and Lee on a journey through the Anangu Pitjantjatjara Yankunytjatjara (APY) lands in northern South Australia and Western Australia, and culminated in a return visit to Patjarr. They discovered that housing at most of the remote communities followed similar patterns – contiguous quarter-acre blocks with three-bedroom houses facing the street – and there was little specialised housing for groups that would traditionally have been separated.

"On that trip we visited Mimili, where the community had identified a need for single men's quarters, which is not a common or typical housing type," Morris says. "Single men were traditionally separated in a camp some distance from the main extended family groups, so they could learn men's business and prepare for their important cultural role as men."

Morris and fellow architectural lecturer, Jason Oaten-Hepworth, took the case for new single men's housing at Mimili to the state's Department of Families and Communities. "Our argument was that because there is a cultural tradition of separating single men, we had a valid case to continue our community consultation to design an appropriate facility," Oaten-Hepworth says.

In 2005 the Department gave informal agreement to fund single men's accommodation for 14 men, with a project value equivalent to two standard three-bedroom houses. Morris, Oaten-Hepworth, Lee and the UniSA architecture students then undertook a lengthy community consultation process to design the buildings.

"The first important design meeting was with a group of young men in the community," Morris says, "and we were given a very clear idea that the accommodation needed to be focused on a central meeting place in the form of a big fire pit, and divided symmetrically around a north-south axis."

The design took into account the ideas embodied in a sketch provided by the young men. "It is amazing how through that one sketch, the men understood the subtleties of the site in relation to the cold and hot prevailing winds, framed views to the northern rocky outcrops, the path of the sun in relation to daily activities in and around the buildings, and their traditional separations based on moiety," Oaten-Hepworth recalls.

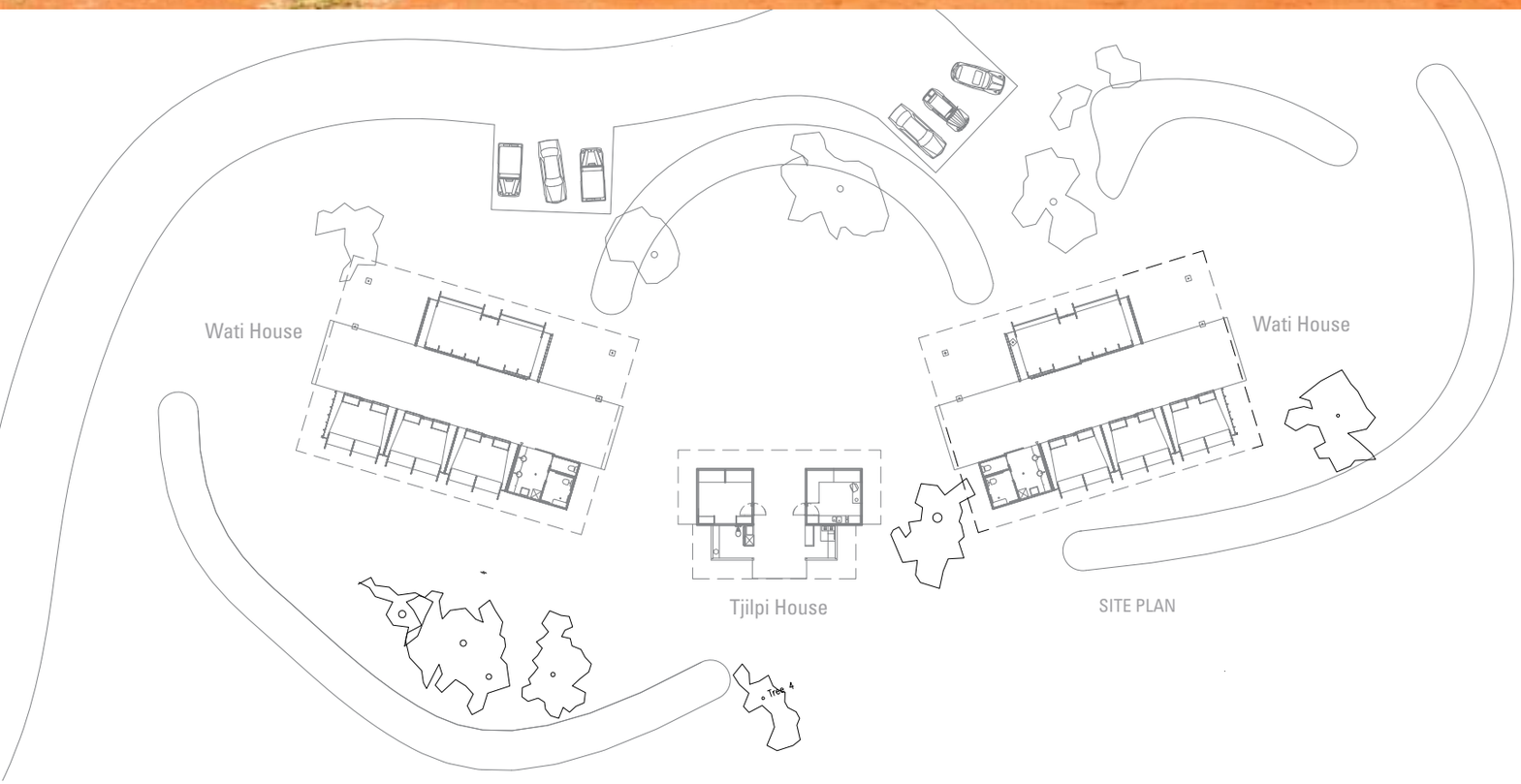
Discussions with the young men and the entire community determined that the most favourable site location was 200 metres outside the community boundary – removed from existing homes – to the south-east of Mimili's football oval.

"We came back to Adelaide and worked with students to develop the design," Morris says. "From that we arrived at the idea of two housing clusters that were angled towards a future central fire pit, facing north to capture the spectacular views of the red granite outcrops of the nearby Everard Ranges."

Thanks to the extensive research that prefaced this project, the designs incorporated many innovations not typically found in Aboriginal housing, Morris says. "One of the problems that we identified in the houses provided in most Aboriginal communities was the compromised open-plan living area, which functions as a kitchen/dining/lounge space but also as the main circulation space, making the living spaces quite dysfunctional," he says. "So our first initiative aimed to separate the bedrooms on the south side from the kitchen/living/dining on the north side, with a central five metre-wide breezeway."

The breezeway is an effective circulation space, open to east-west winds, and also provides sheltered accommodation for visitors who can sleep there in swags.

"We arrived at the idea of two housing clusters that were angled towards a future central fire pit, facing north to capture the spectacular views of the red granite outcrops of the nearby Everard Ranges"



Overcoming the tendency for Aboriginal housing to have a compromised open-plan living space, the design separated the bedrooms on the south side from the kitchen/living/dining on the north side with a central five-metre wide breezeway. It is open to east-west winds and provides sheltered accommodation for visitors who can sleep there in swags

"A clever detailing opportunity arose when we used the grates over the drains as bottom runner guides for our large sliding doors," Oaten-Hepworth adds.

Other measures included acoustic attenuation between the bedrooms which was achieved using double, but disconnected, framing in the party walls, and plenty of built-in furniture. "We designed extensive built-in furniture because the people in the Lands are generally very poor, and either can't afford to buy – or don't have access to – much in the way of tables, chairs, cupboards, shelving and so on," Morris says. "So in the bedrooms we designed built-in bed bases, desks, lockable wardrobes and under-bed storage; and in the living areas, seating, shelving and extra benches."

After a long period of design development, further consultation with the Mimili community and extensive negotiations with the department, a building contract was signed in early 2008 for two separate three-bedroom accommodation quarters for 12 single men, and a one-bedroom house to be located between them for two male elders – or Tjilipis – who would instruct the younger men in cultural traditions and men's business.

With the contract in hand, staff and students began prefabrication of the project in the University's workshops, using methods, materials and techniques that had been tried and tested on earlier projects. Steel framing and cladding were selected as the materials of choice because they are light, easy to prefabricate and transport, and durable in harsh environments.

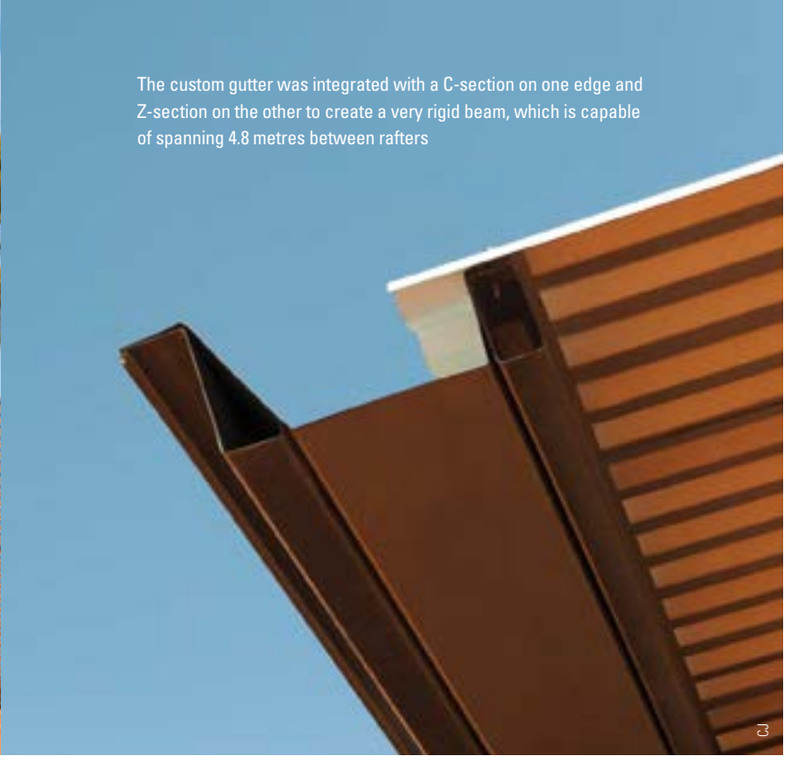
While the size of this project set it apart from its predecessors, the methods of construction had been refined on previous jobs, Morris says. "The building's principal portal frame was constructed with 75x75 SHS DuraGal columns supporting back-to-back 150 galvanised C-section rafters and back-to-back 100 C-sections purlins," he explains. "The internal frames were built using a standard 75 millimetre galvanised steel stud framing system, so that the walls could be prefabricated and lined, and then packed into containers for transport.

"The gutter was a folded section designed to be integrated with a C-section on one edge and

Steel framing and cladding were selected as the materials of choice because they are light, easy to prefabricate and transport, and durable in harsh environments

TOP: Steel was chosen for the portal frame, internal framing, external cladding and internal ceilings, thanks its light weight, ease of prefabrication and transport, and durability in harsh environments

RIGHT: Internally, there is an abundance of built-in timber ply furniture including bed bases, desks, lockable wardrobes and under-bed storage in the bedrooms and seating, storage, shelving in the living areas



The custom gutter was integrated with a C-section on one edge and Z-section on the other to create a very rigid beam, which is capable of spanning 4.8 metres between rafters

CJ

CJ

Z-section on the other, to create a very rigid beam capable of spanning 4.8m between rafters.

"Students also prefabricated steel sliding and screen doors, threshold frames and the cantilevered frames supporting the bed pods using Duragal hollow sections of various sizes – all expertly welded by students who had no previous experience with steel or welding," Morris says. "Other ambitious tasks included fabricating the ductwork from galvanised sheet steel and assembling all the aluminium windows and security screens."

After approximately 200 students had attended eight two-week prefabrication sessions, the first onsite construction – pouring of the waffle slabs – commenced. After the slabs were poured, the construction timetable was largely dictated by weather patterns at Mimili, where the best building conditions occur during autumn and spring. "Winter is less favourable because it is cold and the days are short, and summer is completely unsuitable," Oaten-Hepworth says.

JT

"We actually did a construction class in November 2010 and the daily temperatures were above 50 degrees Celsius. It's impossible to work in those conditions, so when it was unfavourable to work onsite construction continued in the workshops in Adelaide."

As has so often been the case for the UniSA team with previous projects, steel was the preferred material for the buildings' cladding. "Over the six onsite construction sessions that followed, we used a cladding combination comprised of LYSAGHT SPANDEK® and Fielders Spanform because the square corrugated profile is stronger than traditional corrugated profile, and it achieves longer spans," Morris says. "It's also much easier to lay and construct than traditional corrugated profiles."

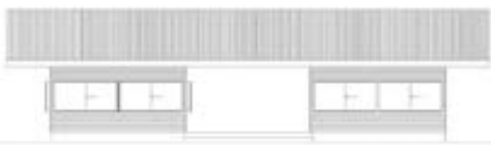
Internally, the ceilings were lined with LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Surfmist®, and the largely neutral colour scheme of the built-in timber ply furniture was offset with bedroom doors painted in Dulux Red Terra.

In addition to the State Government funding, the project received funding from the Federal Government to install BlueScope Water tanks made from AQUAPLATE® steel for the collection and storage of rainwater for use in the houses, which is greatly preferred to the salty bore water supply.

Morris says that the high cost of employing tradespeople at the remote location meant that students built almost everything, and also carried out some of the concrete finishing. "The students did the framing, lining and cladding, and assembled the windows and the roofing – they even built the evaporative air-conditioning ducts and assisted with the plumbing under qualified trade supervision," he recalls. "The only thing they didn't do was the electrical work."

INTERNAL ELEVATION BREEZEWAY WEST LIVING/KITCHEN

WEST ELEVATION



NORTH ELEVATION

INTERNAL ELEVATION BREEZEWAY EAST BEDROOM

EAST ELEVATION









PANEL SAYS

This project embodies many important considerations that are often not adequately addressed by architects or the government agencies that provide remote indigenous housing. As such, it's an exemplar that demonstrates how careful and considered engagement with clients – in this case the people of Mimili in the APY Lands, as well as many other stakeholders – can result in buildings that are culturally appropriate and sympathetic to traditional living arrangements. The three houses – arranged around a central fire pit – feature a clear and clever use of steel that is economical in its construction and assembly. The fact that this project was largely designed and delivered by students makes it all the more worthy of attention.



David Morris (second from left) and Jason Oaten-Hepworth (far right) with the UniSA team

"The benefits for students who are involved in designing and building real projects are absolutely uncontested"

In total, more than 500 students participated in the build, which took place over two years, concluding in April 2011. Former student Michael Phillips was so enthusiastic about the project that he moved from Perth to Adelaide to participate in the program.

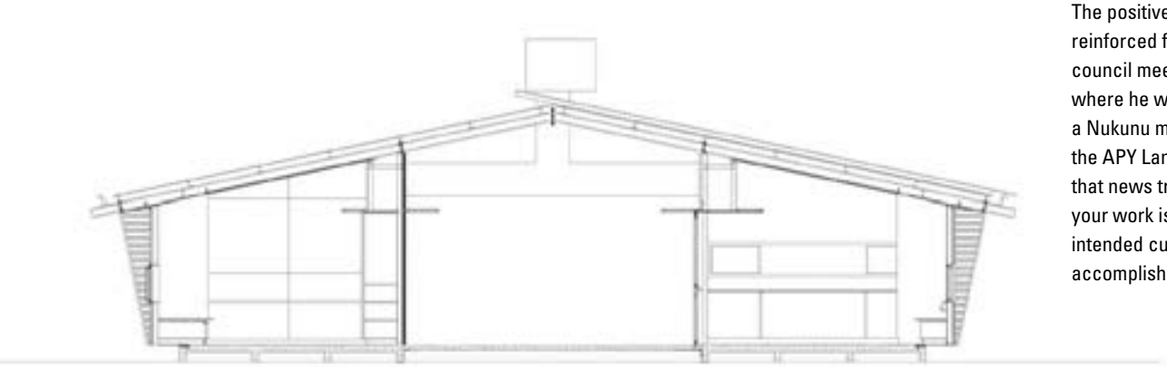
"The student design and construction program gave me the opportunity to take charge of a project which you would not get as a construction labourer," Phillips says. "Understanding in greater detail the materials and processes involved in construction provides another field of creative opportunity in the architectural design process."

In future, Morris and Oaten-Hepworth hope that the university's design and build program can apply the knowledge it acquired on this and earlier projects to specialise in design and prototyping of culturally appropriate housing for Aboriginal communities.

"The benefits for students who are involved in designing and building real projects are absolutely uncontested," Morris says. "It's a way of exposing hundreds of students to not only the design issues relating to Aboriginal housing, but also exposing them to the communities and the unique environment."

Morris is hopeful that that goodwill generated during this process – from inception, through design, construction and finally delivery – will carry forward. "At Mimili, we've always had unanimous community support for the single men's project, as much from the women as the men," he adds. "The community has an obvious sense of ownership of this project."

The positive effects of this engagement were reinforced for Oaten-Hepworth at an Aboriginal council meeting he attended in the Flinders Ranges, where he was approached and congratulated by a Nukunu man who had recently returned from the APY Lands. "The amazing thing out here is that news travels fast, and to be informed that your work is being respected and used in its intended cultural purpose is a great accomplishment," he says. SP



WATI SECTION

PROJECT Single Men's Quarters, Mimili, APY Lands, South Australia **CLIENT** Department of Families and Communities, SA **ARCHITECT** University of South Australia **PROJECT TEAM** David Morris and Jason Oaten-Hepworth **STRUCTURAL & CIVIL ENGINEER** JDR Number 1 **BUILDER, STEEL FABRICATOR, SHOP DRAWING CONTRACTOR AND CLADDING CONTRACTOR** University of South Australia **PRINCIPAL STEEL COMPONENTS** Roofing: LYSAGHT SPANDEK® made from ZINCALUME® steel; Wall cladding: LYSAGHT SPANDEK® made from ZINCALUME® steel and LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Deep Ocean®; Door cladding: LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Loft®; Fin cladding: LYSAGHT PANELRIB® made from COLORBOND® steel in the colour Deep Ocean®; Ceiling lining: LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Surfmist®; Columns: Duragal 90SHS, 50SHS; Rafters and purlins: Cold rolled C and Z sections, C150, C100, A100 **PROJECT TIMEFRAME** January 2008 to May 2011 **AWARDS** UniSA 2009 Chancellors Awards For Community Engagement **BUILDING SIZE** Wati houses (each): common areas: 29.5m^2; external breezeway: 96m^2; bedrooms and wet areas: 59m^2 Tjilipi house: living area and bedroom 22m^2; wet areas 10.2m^2 **TOTAL PROJECT COST** $694,000

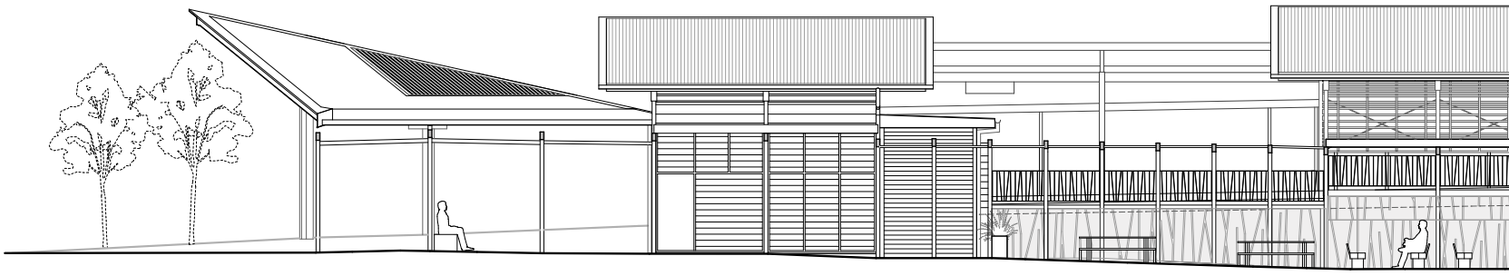
GARDEN GATEWAY

ARCHITECT Bark Design Architects
PROJECT Noosa Junction Station
LOCATION Noosa Junction, Queensland

PB

Bark Design Architects has established a gateway with a difference: a delightfully welcoming, precisely crafted and deliciously green space that speaks much about what lies ahead for visitors arriving in Noosa.

Words **Margie Fraser** Photography **Paul Bradshaw; Christopher Frederick Jones**



Let's be clear: there's Noosa and there's Noosa Junction. To set the scene, Noosa is a stunning beachside town nestled into the arc of one of Queensland's few north-facing beaches. Wedged between a tranquil bay and a wide river, the sand isthmus looks to the distant, impressive dunes of Forty Mile Beach and their famously striated 'coloured sands'.

Glamorous eateries, shops and hotels line its main drag, Hastings Street, without compromising on a cool, casual style that is almost a brand in itself. But the real clincher here is in the bewitching natural beauty of the adjacent hill and National Park, boasting a koala-laden forest edged by granite coves and an azure sea.

Noosa Junction, on the other hand, is Noosa's gateway. Any seasoned traveller hears alarm bells at the mention of gateways as they tend to the pedestrian end of the journey – those points of arrival and departure that so often fall short of expectations and premeditated imaginings. Noosa Junction is no different. Basically a shopping centre on the inland side of the Noosa Headland promontory, it sports acres of carparks, busy roads and roundabouts. As a precursor to the astonishing beauty of its *raison d'etre*, Noosa Junction did little to hint at the gifts and pleasures ahead. Until now.

Bark Design Architects director Lindy Atkin says the station speaks much about what lies over the hill for travellers. "Our idea was not to build a monument, but instead to provide a welcome gesture that responds to the green environment and introduces the built form in a gradual, filtered way."

Sunshine Coast councillor Russell Green was impressed with Bark Design Architects' response to its brief to design an open, light and airy bus station for the Noosa Junction entrance. "For many people, the new Noosa Junction Bus Station is not only the gateway to Noosa Junction, but to the whole Sunshine Coast," says Green.

"Council wanted to ensure the new station reflected the Coast's natural look and feel and not only did the result meet this brief, it has also provided a facility that will encourage more residents to use public transport."

TransLink interim CEO Matthew Longland was equally pleased with the result, saying the station has reinvigorated the local landscape. "It is a precisely crafted and delightfully welcoming interchange for residents and visitors to appreciate," Longland says.

Atkin and co-director Stephen Guthrie worked with Brisbane-based engineers Sinclair Knight Mertz to balance the requirements of a TransLink bus station design with a 'Noosa-look-and-feel' experience.

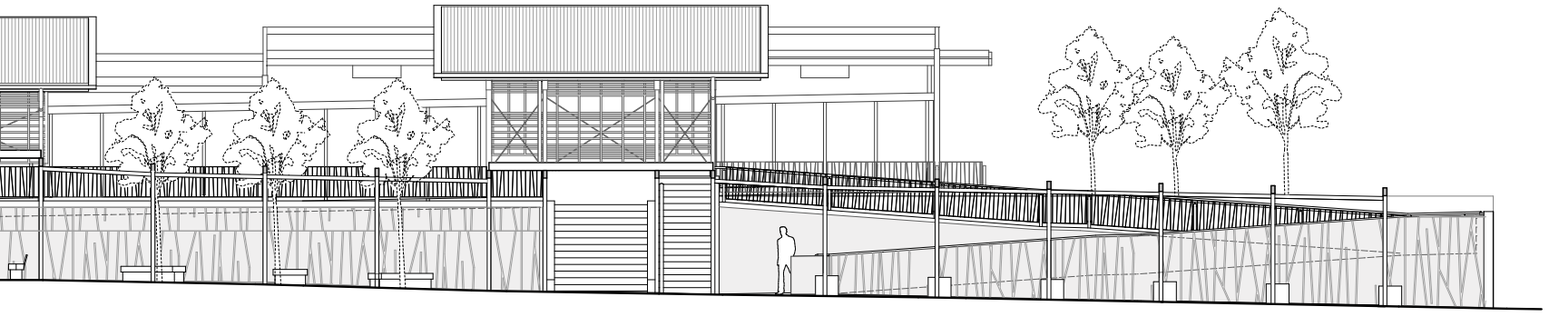
The given site is a shared zone between two major roads. An expanse of wetlands to the east is abundant with melaleucas and strappy grasses. The wildness dissolves and develops into a more formal arrangement of plantings as it closes in towards civilisation, where large figs and shady pandanus palms sit amongst grass lawns.

Buses take a sweeping arc from the main street and round the key northern point of the building, to then rest alongside its main pedestrian circulation spine behind and below.

A powerful welcoming point is in the wide-open gesture of a large steel roof overhang. It is the first part of the building registered by passengers arriving on foot or by bus. Rigidly anchored by impressive galvanised steel pillars and beams, the roof canopy floats and settles lightly like a piece of folded origami. Here and elsewhere, Bark Design has cleverly developed a pleasing tension between rigidity of form and organic, freeform lines: a combination of strength and lightness.

The roof is a parasol for refuge from sun or rain, a sculptural canopy that also introduces elements of vernacular architecture and materials. The steel components offer an unadorned simplicity and functionality that are not surprising in a public space, but nevertheless are servile to and strike a balance with the more domestic readings of other materials and surfaces: lime-washed ply ceilings, glass, timber-framed sliding doors, chamfer board walls, and recycled timber posts among them.

The architects' idea was not to build a monument, but instead to provide a welcome gesture that responds to the green environment and introduces the built form in a gradual, filtered way. Buses arrive from the road to the east and sweep around the welcome zone to the parking and disembarkation zone on the western side

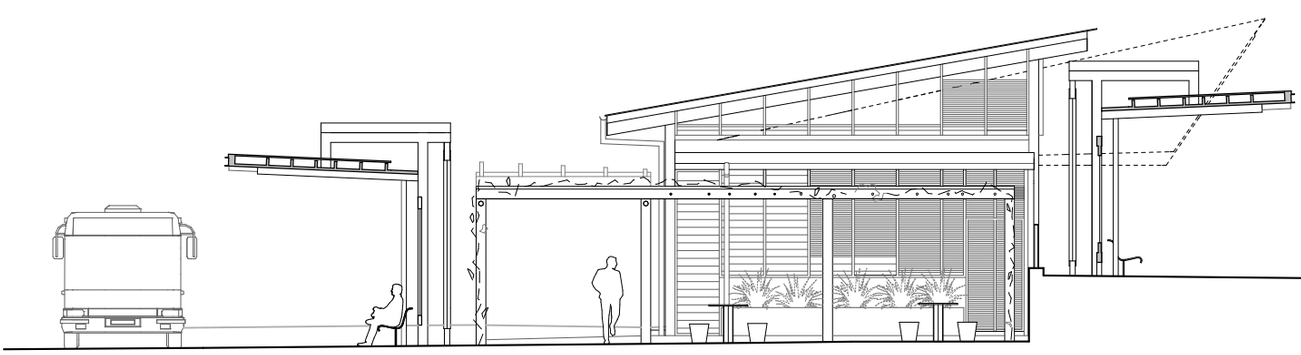


LONG SECTION

Bark Design has cleverly developed a pleasing tension between rigidity of form and organic, freeform lines: a combination of strength and lightness

CFJ

ABOVE: A wedged roof tilts to the north, pointing to the leisure zones of Noosa Headland and beach. The deep shelter serves as gathering and information point for the Noosa Junction bus station, and sports a glass wall ready for interpretive installations by local artists



CROSS SECTION

A consistent play with transparency and permeability is achieved through the use of open spaces and foliage-as-canopy, as well as through the virtue of the strength of the steel structures which allow for large overhangs and cantilevers

The sharp point on the northern end of the canopy acts as a built-in orientation device leading to the 'promised land'. The untreated galvanised steel is part of the raw and honest material palette, and its expression is highlighted at night with runnels of silver lights. The solid pillars enable a vaulting, welcoming cantilever and unintimidating meeting place and surveillance point. An information pod sits under the overhang: its wall of glass acting as the canvas for video and soundscape artwork commissioned by the local council.

Continuing the landscape element through the terminal was a primary incentive in the design, and this is memorably achieved through a vine-encrusted arbour that runs along the site's east-west axis. The arbour introduces a rustic element in its recycled timber posts (which originate from a 1930s wharf deck in Mackay) that are fixed with steel braces. A series of 'garden rooms' peel off the spine, establishing protective courtyard spaces that nestle into the natural slope of the hill.

"There are three main pods with gardens between," explains Guthrie. "The information pod, the shade pod and the stair pod are defined by a pergola floating garden, a grove garden, a vertical garden and a melaleuca grove, all brought to life by Rob Wadell from Guymer Bailey Landscape."

Destined to be shady sub-tropical havens once the trees have established themselves, each space takes on a different character and amenity. Travellers can sit and write a postcard, re-pack a bag, or dine at purpose-built tables. A unisex amenities block (fully ventilated but secured with battened screening) also opens to a garden courtyard space, and the various gardens provide observation decks to register which buses arrive and leave. The breezy outdoor waiting rooms are also stop-off zones for pedestrians and cyclists who've made their way from Sunshine Beach (to Noosa's immediate south) through a tunnel which lands at the eastern end of the arbour.

The arbour is rapidly becoming vine-laden. It acts as a transition zone between garden courtyards and embarkation platforms, as well as an attractive loggia for inter-beach traffic.

Platforms are fitted in standard TransLink shelter fittings, but instead of using regular flat profile counterparts, Bark added acoustic properties to LYSAGHT SPANDEK® ceiling panels made from COLORBOND® steel in the colour Surfmist® by perforating them.

"The SPANDEK® can be applied to very shallow pitches," says Atkin, "which looks so much more refined and allowed for a simple profile."

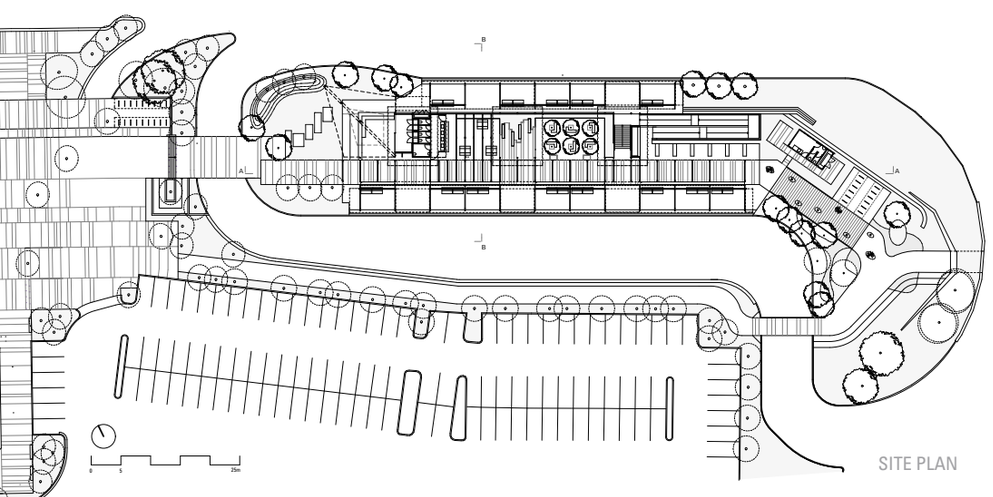
The textural play of the perforated material was also a lure for Bark. Between the solid-shade LYSAGHT SPANDEK® sections are other added extras. Clear polycarbonate roof panels are lined beneath with white polycarbonate cut-outs abstracted from pandanus, throwing leafy silhouettes onto the paths below and providing a forested croft through which to see the sky or stars.

A consistent play with transparency and permeability is achieved through the use of open spaces and foliage-as-canopy, as well as through the virtue of the strength of the steel structures which allow for large overhangs and cantilevers. A sense of the sky, the sun, the clouds and the stars is paramount, and shelter is largely confined to an edge condition rather than the execution of a giant dark shed mentality.

Another virtue of the strength and magnitude allowed by the use of steel is its ability to mediate between the larger-scale buildings beyond. The bus station seems to lift its cap and greet the two- and three-storey buildings yonder with ease, integrating between the scales with commanding efficiency. SP

ABOVE: Pandanus palm motifs form part of the translucent inset panels in the waiting zones

BELOW: The site plan and image shows how gardens are incorporated in the plan, mitigating between eastern and western roads. A circulation spine is made of recycled timber. The colonnade forms an arbour between garden rooms and bus drop-off zones



SITE PLAN

PANEL SAYS

This new transport interchange at the main entrance to Noosa Junction provides a contemporary and very prominent welcome to the famous holiday destination. We particularly like the "spidery" quality of the fine steel work, which supports a soaring cantilevered roof. The two elements eloquently reflect the look and feel of Noosa, thereby creating a truly regional response. The project features a skilful use of structural steel to achieve the desired effect of permeable space at platform level, while the pandanus tree-like pattern in the glass ceiling creates a delightful shadow-play on the ground that helps to elevate this project above typical public transport hubs.

PROJECT Noosa Junction Station **CLIENT** Sunshine Coast Council and TransLink Transit Authority **ARCHITECT** Bark Design Architects **PROJECT TEAM** Stephen Guthrie, Lindy Atkin, Christoph Klein, Peter Morrison, Phil Tillotson, Matt Hughes, Viggo Johnsen, Anthony Mitchell **STRUCTURAL ENGINEER** Sinclair Knight Merz (SKM), Brisbane **CIVIL ENGINEER** SKM **ELECTRICAL ENGINEER AND LIGHTING DESIGN** SKM **BUILDER** Golding Contractors **STEEL FABRICATOR** Scott and Ensoll **SHOP DRAWING CONTRACTOR** SA Coppin Steel Detailing & Design **CLADDING CONTRACTOR** Cribb Construction **LANDSCAPE ARCHITECTS** Robert Waddell, Adrian Sheppard, Guymer Bailey Landscape **PRINCIPAL STEEL COMPONENTS** Roofing: LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Woodland Grey®; Flashings & gutters: COLORBOND® steel in the colour Woodland Grey®; Ceiling panels: perforated LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Surfmist®; Structural steel: fabricated columns and beams; pod columns; roof edge beams; roof tie struts; vertical bracing; rafters; walkway frame purlins; fascia purlins **PROJECT TIMEFRAME** July 2010 - August 2011 **BUILDING SIZE** Under-roof area: 1113m^2; Project area: 12,800m^2 **TOTAL PROJECT COST** $10 million

SLENDER CONTENDER

Muir and Mendes has harnessed steel's sculptural and elemental potential to prove that a 'mansion' – though doll house-like in dimensions – can be created in the most unlikely of places. Words **Peter Hyatt**
Photography **Peter Bennetts; Peter Hyatt**

ARCHITECT Muir Mendes
PROJECT Law Street House
LOCATION South Melbourne

PB

37

ABOVE LEFT: A simple drawbridge-style window wall ensures privacy while the double-height passage draws the eye towards a specimen palm
ABOVE RIGHT: Minimal structural intervention through steel creates a pared, open plan

Beauty can be found in improbable places. A tight allotment, derelict cottage and unremarkable streetscape can be quite enough to turn off home builders.

The Muir Mendes Law Street House in inner-city South Melbourne is a triumph over adversity. A site of just 93 square metres – somewhere between a squash and tennis court – featured a termite-infested cottage. Yet, it became the object of desire for Melbourne architects Amy Muir and Bruno Mendes.

What was there to love? The architects certainly saw potential. Call it naivety, call it vision, but their transformation from a gloomy little house is astonishing. A highly pared form and ingenious, interlocking space framed and detailed in steel has produced the baby-grand.

Their mission to convert the dilapidated 125-year-old house ended up less a renovation than total re-build. "Once we began tearing down the old house," Muir says it triggered a panic attack. "I felt sick, really sick. I asked myself: 'What have we done? What are we doing?'"

The path of least resistance is bound to produce bland and lousy buildings. Perseverance is architecture's essential partner to ingenuity. Just when everything points to mediocrity, there are those who resist the urge to roll over or leave quietly. A puny budget, stifling regulations, dwarfed allotment, indecision and limited labour skills – all potentially disastrous – needn't signal 'game over'.

Armed with little more than self-belief and a willingness to perform most of the hard labour themselves, the pair set about converting darkness into light. They chose to live in their dilapidated cottage for a year, first, to fully familiarise themselves with the site and conditions. "It was dark and dingy," says Mendes. "Very Dickensian. It was absolutely awful. It made us so determined to completely reverse that dinginess. Well, we've done that."

Now, daylight fills the house and excellent control of ambient light and temperature is possible thanks to vast skylight strips and double-glazing.

Mendes says the design is absolutely location-specific. "If we had an open, greenfields site it would be nothing like this," he says. "We're just 'curating' a set of situations."

Three-and-a-half-years in the making, it's a house that wins no prizes for speedy turnaround. Hand-crafted, the residence is the antithesis of the slap-it-up, suburban blockbuster. Working every weekend as labourers/builders, the pair fabricated and built virtually every part of the building.

Their almost monastic existence extended over the entire construction program. Early to bed, early to rise was their motto for a weekend labour of love. "We'd arrive home from a week's work, roll up our shirt-sleeves and set off again," recalls Muir of their relentless schedule. "It also provided an unusual insight into the whole process of design, fabrication and construction."

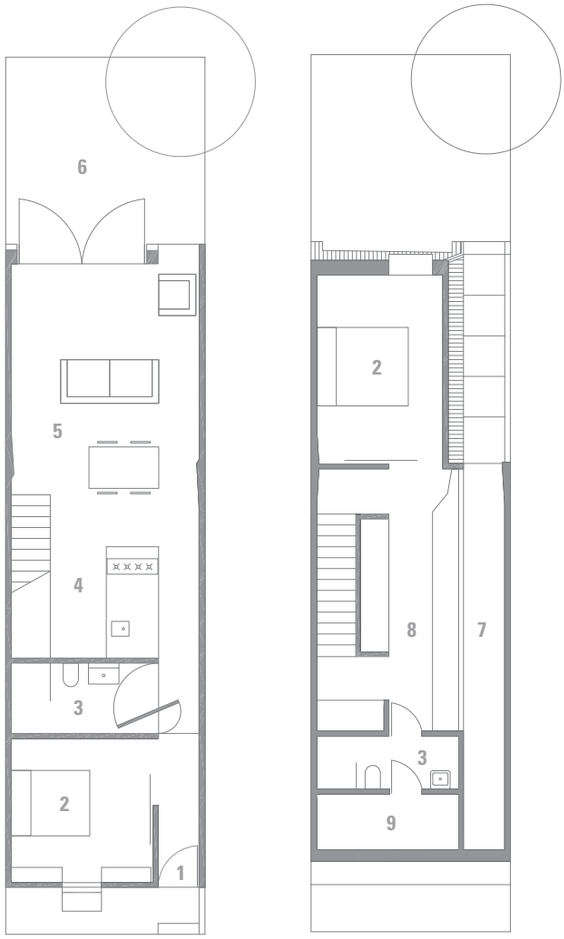
The couple cites the huge influence of Mendes' father whose vocabulary with steel is pivotal throughout. "The fact that so much of it is constructed of steel is because of my father," Mendes says. "His influence and expertise is everywhere.

"He taught me how to build. He's a steel fabricator and from a very young age I was brought up with the philosophy of: 'If you don't know how to build it, then you learn how'."

Mendes Snr manages steel fabrication for a large construction company and formed the final vital link. The couple likes to playfully refer to the lengthy program of demolition, excavation and construction as 'the daddy Mendes apprenticeship'.

"The influence of both fathers is definitely here," says Muir, whose woodworking-skilled father added his eye to the assembly. "Having that expertise on hand was invaluable and gave us the confidence to proceed."

"Getting our hands dirty really taught us so much about materials and the way the building comes together"



GROUND FLOOR

FIRST FLOOR

LEGEND

1. Entry
2. Bedroom
3. Bathroom
4. Kitchen
5. Living room
6. Courtyard
7. Void
8. Study
9. Store room

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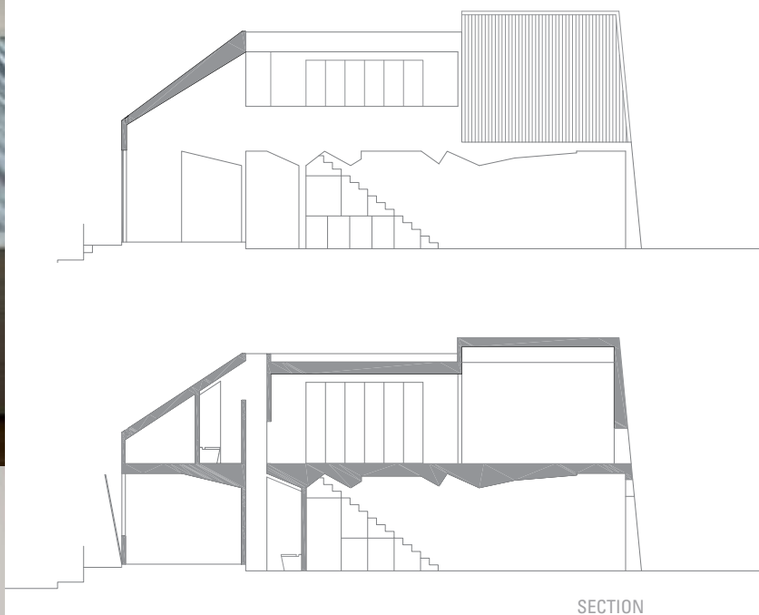


SECTION

TOP RIGHT: A tiny 'backyard' adopts sympathetic material rhythms, order and angularity to create a contemporary take on the old

LEFT TOP AND BOTTOM: The kitchen/dining/living rooms are a dynamic volume emphasised by a folded ceiling that recalls the original terrace roofline. Like a sundial as canvas or projection wall, the south-facing living room wall catches striated light throughout the day

PH

Inspired by the sleek aerodynamics of stealth aircraft, the owners' work space, a study desk, reflects a similarly sharp aesthetic using folded steel plate

OPPOSITE: The ingenious steel plate staircase nods towards Japanese origami

"Working so extensively with steel was a huge learning curve," says Mendes of the material long ago burdened with prejudices about its suitability for anything other than shipyards. "Perceptions about steel continue to change. The old fear about it has disappeared." Evidence of such an enlightened attitude can be found in the plasticity of the staircase, the thin, wafer-like steel joinery and panels that slenderise elements that would otherwise rob critical space.

"Steel has an amazing capacity," Mendes comments. "It can be sharp, or soft, have crisp edges and the surface can be physically and visually cool or warm. When it's skillfully handled it can become almost anything at all.

"It also fits with our attitude towards craft. We love crafting details and understanding materials. You need to know those limits and potential. An appreciation of materials is important. If we want something to look like steel or concrete then we would never fake it to resemble what it wasn't."

Steel construction was adopted to combat the tight site and aggressive termites. Windows, doors, stairs and joinery have been fabricated from steel, which punctuates the white interior. Tallow-wood flooring was selected, given that it does not suit the selective palate of the termite. The flooring folds through the space and up the walls, providing a robust skirting.

"Yes, some of the steel here has its blemishes but that is also part of the character," says Muir. "It has weld marks and can be cool or warm. There's the experience of walking up the staircase in summer with bare feet and it's so pleasant. That's a tactile quality that only becomes apparent after it's installed."

Mendes agrees that their house is largely experimental. "It's a design laboratory of sorts because of its prototype build qualities." There are whimsical moments too. Take, for instance, food storage drawers cleverly concealed under the ultra-slim, folded steel staircase.

"Yes it's very small, but if this was Japan it would almost be considered a mansion," Mendes says of creating astonishing dimension from the 93 square-metre site. "It's all relative."

PB

PANEL SAYS

This house is situated in a high termite area so the owner-architects have made clever use of steel for the framing, external walls and roof. We especially like the front facade, which is a daring approach to the heritage-style streetscape. It sets up an intimate engagement with steel that is continued internally through the custom "joinery", which includes the steel-plate staircase, bookshelves, desk, and the steel-framed windows and doors. The interiors benefit from a beautiful undulating ceiling in the ground floor living area that – in combination with the abundance of natural light pouring in from skylights – creates an ever-changing ambience that must be a pleasure to inhabit.

The building's second storey within the adjusted roof pitch echoes the original cottage roofline and the 'draw bridge'-style front window provides privacy and curates light to the front bedroom.

Key structural and decorative elements include a secondary structure constructed from metal studs (no timber framing was used in order to avoid termite-related issues), a front facade and roof-line constructed from plate steel painted with International Paints Interthane 870 – which was also used on the letterbox/service cupboard and rear facade – and clad in LYSAGHT SPANDEK® made from ZINCALUME® steel. The main rear window and door frames are custom-made and fabricated from steel, along with custom-made steel plate hydronic heating panels. Sculptural elements include inbuilt joinery to the study desk, fabricated from folded plate steel. Similarly, stair treads and risers are fabricated from folded plate steel and a custom-designed bookshelf made from steel plate continues the vocabulary.

The couple's desire for visual calm and cohesion throughout is achieved with cascading, interlocking spaces and a monochrome palette. It's an attitude that repeatedly nods towards Japan.

Externally the charcoal-coloured street elevation provides little hint of the quite luminous interiors ready to unfold. Two bedrooms, two bathrooms, one study, open-plan living and storage have been carefully crafted into 115m² across two levels. The house is divided into two living zones with a first-level gallery study forming an in-between space. Borrowed light and vistas articulate living spaces as places for contemplation.

Muir adds that the design pays homage to the past. "Just because something is erased doesn't mean it should be forgotten," she says. "The ceiling profile mirrors the original dwelling roof-line. It's quite abstract and peripheral to the experience but it's definitely there as an echo of the old."

Mendes believes design should be all about possibility. "What is architecture? It can be anything you want it to be, he says. "Getting our hands dirty really taught us so much about materials and the way the building comes together."

Muir says architecture has to be more than a business transaction. "Care is such a lovely thing to see in what people do," she says. "There has to be a level of commitment and love. Once again, it comes back to seeing materials in their raw form and having something to celebrate.

"Several years ago we visited Oscar Niemeyer's work in Brazil. He's 104 and still working. That's inspirational. We're inspired by many of those aged modernists. Hopefully that's reflected in the way we've gone about this."

Pointing to a peacock steel-blue patina, Mendes extols its quiet, almost sensuous, materiality. "Do you see the colour?" he says. "That's how it comes out of the furnace."

"You can't replicate it… that's what steel does," Mendes observes of the paradox of imperfect precision that provides steel's unique fingerprint.

Barely bigger than a doll's house, Muir and Mendes prove there's a mansion to be discovered in the most unlikely of places. In all, it's quite the revelation. **SP**

PROJECT Law Street House **CLIENT** Amy Muir and Bruno Mendes **ARCHITECT** Muir Mendes **PROJECT TEAM** Amy Muir, Bruno Mendes **STRUCTURAL ENGINEER** Wallbridge & Gilbert **BUILDER** Bruno Mendes, Joaquim Mendes, Amy Muir **STEEL FABRICATOR** Joaquim Mendes **PRINCIPAL STEEL COMPONENTS** Primary structure constructed from steel; Secondary structure constructed from metal studs; Front facade and roof-line constructed from 3mm painted plate steel; Rear facade is clad in LYSAGHT SPANDEK® made from ZINCALUME® steel; LYSAGHT SPANDEK® roofing made from ZINCALUME® steel; Window and door frames fabricated from steel; Custom-made steel plate hydronic heating panels; Folded steel plate joinery, stair case and book shelf **AWARDS** Australian Institute of Architects National Commendation for Small Project Architecture; Australian Institute of Architects VIC Award for Residential Architecture, New Houses **BUILDING SIZE** 115m²

BIRD OF PARADISE

Donovan Payne Architects' aerodynamic approach to a Perth pool project has resulted in a striking design evocative of bird-like forms. Words **Trish Croaker** Photography **Katrina Hawley**

After being initially approached by St Hilda's Anglican School for Girls to investigate options for new swimming facilities and to review the school Master Plan, Donovan Payne Architects – or dP(A) – was eventually appointed to design and deliver a new 50-metre pool on the campus.

The result is an eight-lane pool designed to accommodate a range of aquatic activities.

A geothermal aquifer located a kilometre below the surface, provides heat for the pool's water. The pool is also sheltered by design-defining steel windbreaks evocative of a bird in flight.

dP(A) director Carl Payne said the practice drew on the firm's extensive experience designing aquatic centres in Western Australia, nationally, and in Singapore and Vietnam. However, the St Hilda's project differs from previous works because it is an outdoor pool rather than an indoor facility.

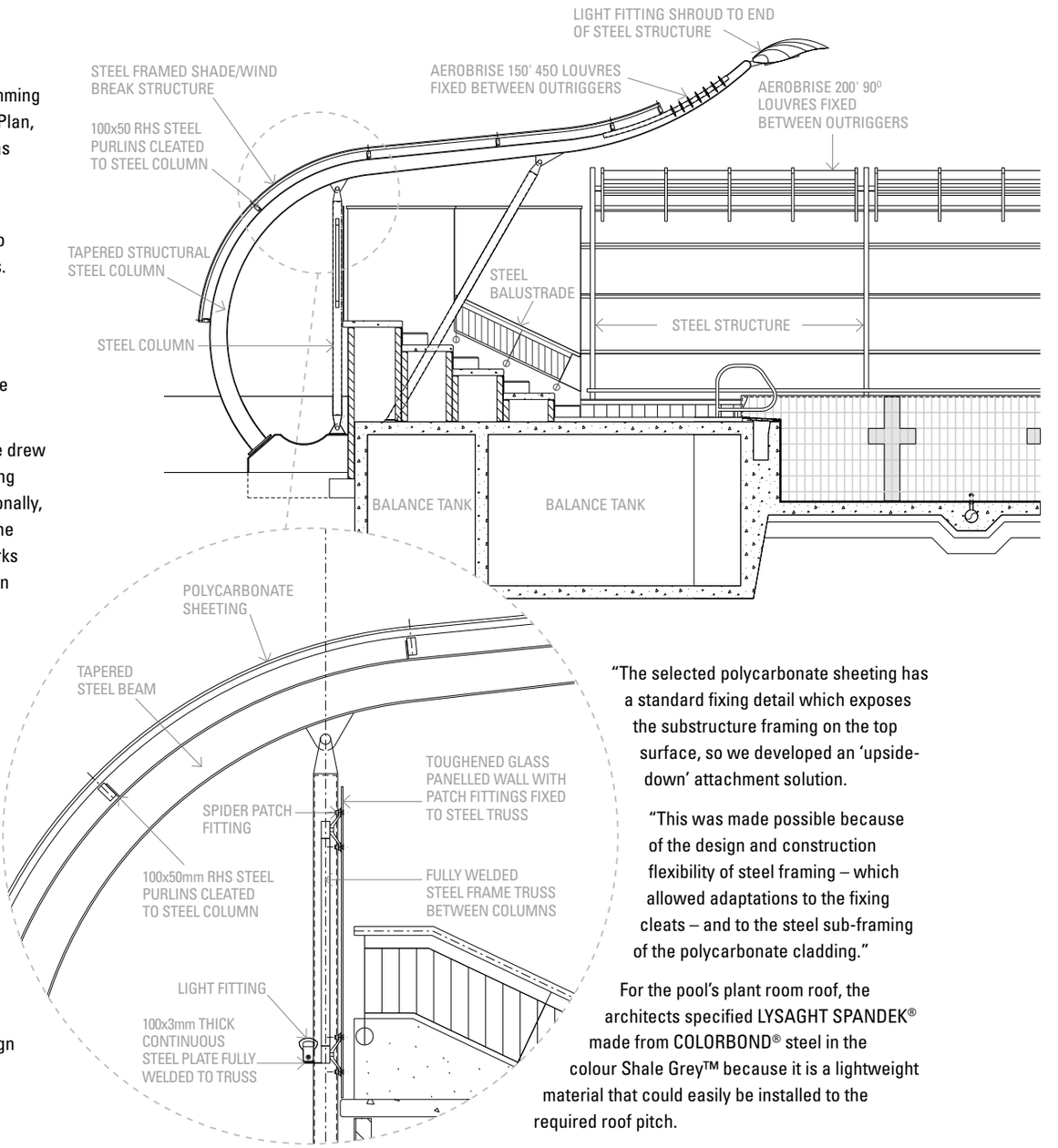
This required the development of wind-break structures to modify and lessen the effects of prevailing south-west breezes, which blow across adjacent sports fields to the south of the pool site.

"The wind-breaks were designed in steel because we wanted to create an aerodynamic shape: a smooth form that would act to deflect the at-times strong prevailing winds blowing over the pool," Payne says. "Steel was really the only material which would satisfy this criterion, as well as providing the ability to easily cantilever over the pool-side seating.

"We developed a wind-break section design that provides not only this, but also gives shelter on the sports field side for those viewing and participating in those events. It's working hard for its living," he says.

"The wind-breaks were a challenge, not only for the above reasons, but because the structure also needed to be founded above suspended slabs over the pool plant rooms, and the pool balance and backwash tanks.

"Our engineers had to integrate steel and concrete structures in a way that was also easily buildable."



The resulting shelter – constructed primarily with hot-rolled universal section framing – is visibly striking in its lightness and transparency.

"One important aesthetic we pursued was the creation of a smooth and even top surface to the windbreaks, in order to maximise their aerodynamic efficiency," Payne says.

"The selected polycarbonate sheeting has a standard fixing detail which exposes the substructure framing on the top surface, so we developed an 'upside-down' attachment solution.

"This was made possible because of the design and construction flexibility of steel framing – which allowed adaptations to the fixing cleats – and to the steel sub-framing of the polycarbonate cladding."

For the pool's plant room roof, the architects specified LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Shale Grey™ because it is a lightweight material that could easily be installed to the required roof pitch.

Officially opened in late 2011, the pool is already proving itself to be a thriving centre of school life.

Not just a strikingly aerodynamic-inspired shelter, it is also an incredibly efficient and functional facility for the school and its community while providing a comfortable environment for students and spectators to enjoy aquatic activities. SP

PROJECT St Hilda's Anglican School for Girls – New Pool **CLIENT** St Hilda's Anglican School for Girls **ARCHITECT** Donovan Payne Architects **PROJECT TEAM** Carl Payne, Scott Oswald **STRUCTURAL & CIVIL ENGINEER** Airey Taylor Consulting **BUILDER** Perkins Builders **PRINCIPAL STEEL COMPONENTS** Structural: Hot-rolled universal section RHS and I-beam framing, Metro Lintels curved wind-breaks; Roofing: LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Shale Grey™ **PROJECT TIMEFRAME** 18 months (extended due to geothermal bore delay) **BUILDING SIZE** 3000m², including pool **TOTAL PROJECT COST** $6million, plus geothermal costs

43

An ‘upside-down’ attachment solution was made possible because of the design and construction flexibility of steel framing

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