

120

MAY 2015
ARCHITECTURAL
STEEL INNOVATION
WITH BLUESCOPE

STEEL PROFILE

BKK ARCHITECTS

GEELONG RING ROAD REST AREAS

CLARE DESIGN

BURLEIGH HEADS GRANNY FLAT

IN PROFILE:

NG SEK SAN



EDITORIAL

Welcome to *Steel Profile* 120.

We are, as always, proud to bring our readers a collection of some of the finest steel buildings in this country (and beyond) and glimpses into the talented, creative people responsible for them.

BlueScope has an especially strong connection to one of the projects featured in this issue, having fast-tracked the development of Low-Glare Coated DECKFORM® steel so it could be used for the first time in the expansion of the Wollongong Central shopping centre, which was designed by a locally born-and-bred architect.

A distinctive shroud of blades adorns the building's facade, offering an obvious reminder that this is a steel building; an amenity made for the Illawarra community from a material produced by people who work in the nearby Port Kembla Steelworks.

A story and video of the project also can be found via steel.com.au/steelprofile

We trust you will enjoy our print and online coverage. Please feel free to share your thoughts with us via info@steelprofile.com.au

Scott Gregory
BlueScope editor

EDITORIAL ADVISORY PANEL

Steel Profile has 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. SJB Architects recently won two Australian Institute of Architects NSW Awards for Multiple Housing.

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 prizes



JAMES LODER

James Loder is a graduate architect working at John Wardle Architects. Graduating from RMIT with a Master of Architecture (First Class Honours) in 2012, James was awarded the 2013 BlueScope Steel Glenn Murcutt Student Prize.

His work explores the formal relationships between building and landscape with great consideration given to spatial expression and materiality

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BKK Architects' playful yet practical design for rest areas on the Geelong Ring Road pays homage to medieval spires and clock towers while performing the important civic duty of combatting fatigue



A modern take on old-fashioned hospitality, Clare Design's luminous, steel-clad pavilion is informed by a passion for considered shape and space, and bears a direct vocabulary of streamlined materials

Principal Corporate Partner



COVER PROJECT
Geelong Ring Road Rest Areas
PHOTOGRAPHER
John Gollings



This house by Misho + Associates with its bold steel framing and colourful screens seems to both stand out and blend into rolling Tasmanian farmland



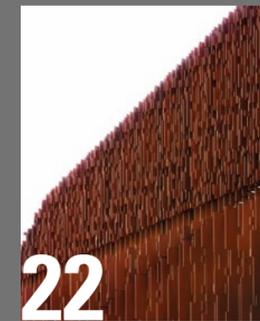
Woods Bagot has expertly spun a complex web of steel, aluminium sunshades and mesh to create an iconic medical research facility for Adelaide



Ng Sek San's projects push the boundaries of architecture, landscape and social change, combining buildings and landscape in an unorthodox yet seamless union, and reflecting the essence of his country and people



Welsh + Major play on ideas of lightness and solidity with customised, highly refined steel cassettes that have transformed a heritage police station



HDR Rice Daubney conceptualised the facade of this Wollongong shopping centre as a series of craggy, jagged forms evoking the iconic escarpment that runs above the city

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REST-AREA RONCHAMP

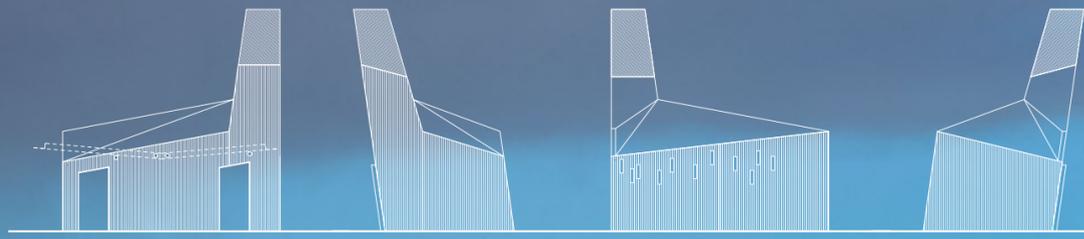
Equally adept at designing tall residential towers, civic masterplans and commercial buildings, BKK Architects has also established a reputation as preferred architects for roadside rest areas. Its latest project on the Geelong Ring Road is a beacon for drivers who need a break.

Words **Alex Taylor** Photography **John Gollings; Paul Bradshaw**

ARCHITECT
BKK Architects

PROJECT
Geelong Ring Road Rest Areas

LOCATION
Warrnambool, Victoria



NORTHERN AND SOUTHERN REST AREA ELEVATIONS

When I first saw images of these tiny toilet blocks beside a new freeway, I was immediately struck by their resemblance to Le Corbusier's famous architectural mecca: the Chapelle Notre-Dame-du-Haut at Ronchamp in France. Architect and BKK director Julian Kosloff says that it's "one of several civic references that have informed this project".

BKK's client, VicRoads, is a world leader in efforts to reduce deaths and injuries on the state's roads. In 2013 the state government launched *Road Safety Strategy 2013-2022*, developed in partnership by VicRoads, the Transport Accident Commission (TAC), Victoria Police and the Department of Justice, with the aim of reducing fatalities and serious injuries by more than 30 per cent by 2022*.

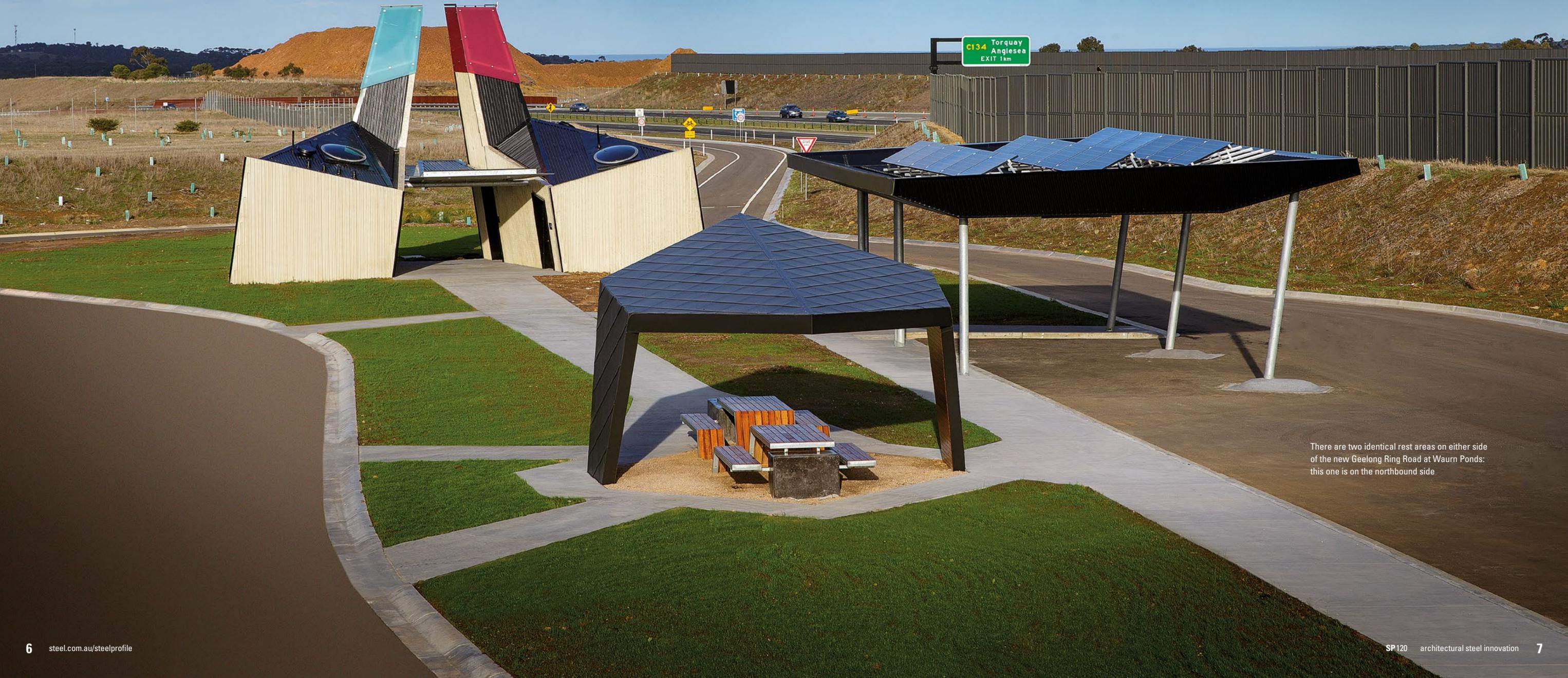
One of the key areas of concern identified in the strategy is driver fatigue, which is estimated to play a role in 20 per cent of all crashes and 60 per cent of truck crashes*. Because fatigue is "the single most significant cause

of road crashes involving heavy vehicles", according to VicRoads, it is committed to providing highly visible, appealing and enjoyable places for drivers, especially truck drivers, to stop and rest.

BKK Architects won acclaim and awards for its first project of this type, the Calder-Woodburn Rest Area near Shepparton, completed in 2008 (see *Steel Profile* 104). In 2010 the firm won a limited competition to design new rest facilities on both sides of the Geelong Ring Road, a \$235 million freeway bypass completed in 2013.

Kosloff sees great value in these typically small-scale buildings, which he says are important elements within the freeway landscape. "The potential for good design to directly improve road safety validates VicRoads' investment in these projects," he says. From an architectural point of view they can be challenging and thought-provoking, too. "VicRoads is committed to the design process and interested in the way in which architectural ideas can enhance the unusual space that is the freeway," Kosloff says. "In addition the simple, utilitarian program of these buildings opens the opportunity for expressive form and almost limitless expression." ↗

"The reference to the chapel at Ronchamp was a tongue-in-cheek way of posing the question: 'Can these structures be important civic buildings?'"



There are two identical rest areas on either side of the new Geelong Ring Road at Waurn Ponds: this one is on the northbound side



The roof and covered breezeway read like butterfly wings, with skylight openings forming the 'markings' on the 'wings'

BELOW: The men's (blue) and women's (tangerine) restrooms are naturally lit and ventilated from above by skylights and skytowers

This project – which comprises two identical groups of structures on either side of the new Geelong Ring Road at Waurin Ponds, 14 kilometres south-west of Geelong – draws upon multiple references to create prominent markers in the landscape.

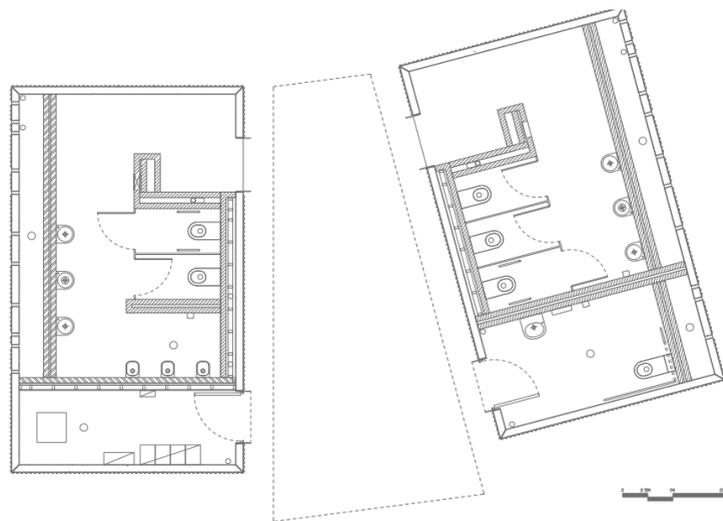
"We carefully considered the context in which these buildings sit: what it means to experience them while driving at 100 kilometres per hour and the manner in which they might be read upon approach," Kosloff says. "We thought about them as gateway structures or landmarks, which might provoke the drivers' interest to stop.

"We explored the idea of them as beacons, or lighthouses, and the reference to the chapel at Ronchamp was a tongue-in-cheek way of posing the question: 'Can these structures be important civic buildings?'," he adds.

"The buildings are humorous and the architectural language draws from many sources," he continues.

"They reference popular culture, but also pay homage to civic spires and clock towers in medieval towns. They are markers that locate the driver within the freeway landscape."

The buildings are immediately identifiable by their tall, illuminated red and blue turrets that play both aesthetic and functional roles. These coloured skytowers – constructed using a steel-framed cage with steel cladding at the base and interlayer glazing at the apex – sit on top of ribbed precast concrete walls: they are the most visible element from the freeway. They also act as thermal chimneys to draw through fresh air, which enters the spaces via the entry doors and vents in the lower walls.



REST AREA FLOOR PLAN



Come closer and the buildings unfold as a series of intriguing and tactile forms. The rest areas themselves were framed using structural steel, a combination of rectangular and angle sections that create the impression that the men's and women's toilet blocks are leaning on each other.

"It's almost impossible to achieve that effect with precast concrete alone, so the precast and steel are fundamentally linked as a structural system: the lean of the precast relies on the steel to hold it up," he says. "The use of steel allowed us to achieve the dynamic form that we wanted.

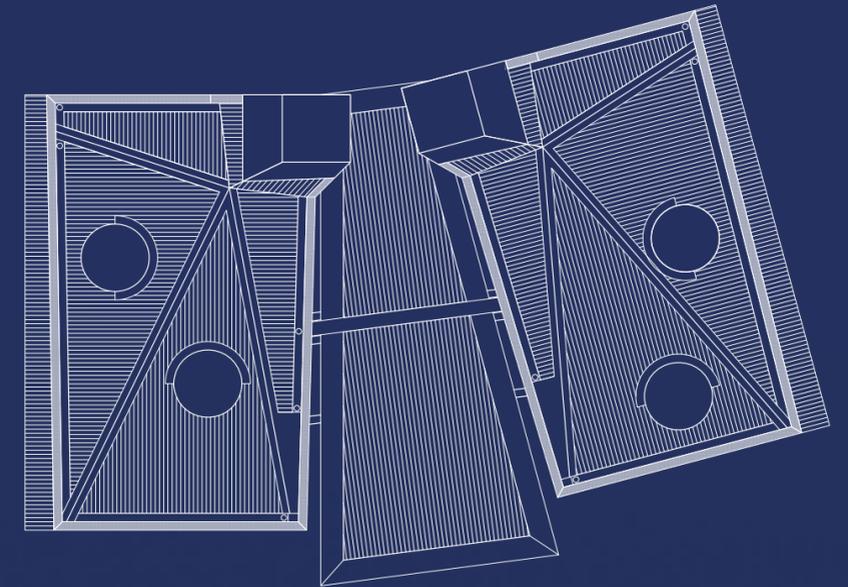
"The shop drawings were quite complex because of the inter-reliant relationship between the steel and the precast concrete. The steelwork had to be very accurate," Kosloff says. "For the structural steel we had a one-inch thick pile of shop drawings to ensure a precise fit, prepared by the steel fabricator, Custom Metal Works. The shop drawings are to be commended, they are very clever."

Seen from afar, the roof and covered breezeway resemble the wings of a moth or butterfly, thanks to the round skylight 'markings' on the 'wings'. Kosloff specified LYSAGHT SPANDEK® profile made from COLORBOND® steel in the colour Night Sky® for the roofing and chimney cladding for several reasons. "It was partly aesthetic – to accentuate the roof form against the daylight sky – but also to recess it and prioritise the lit beacons at night," he says.

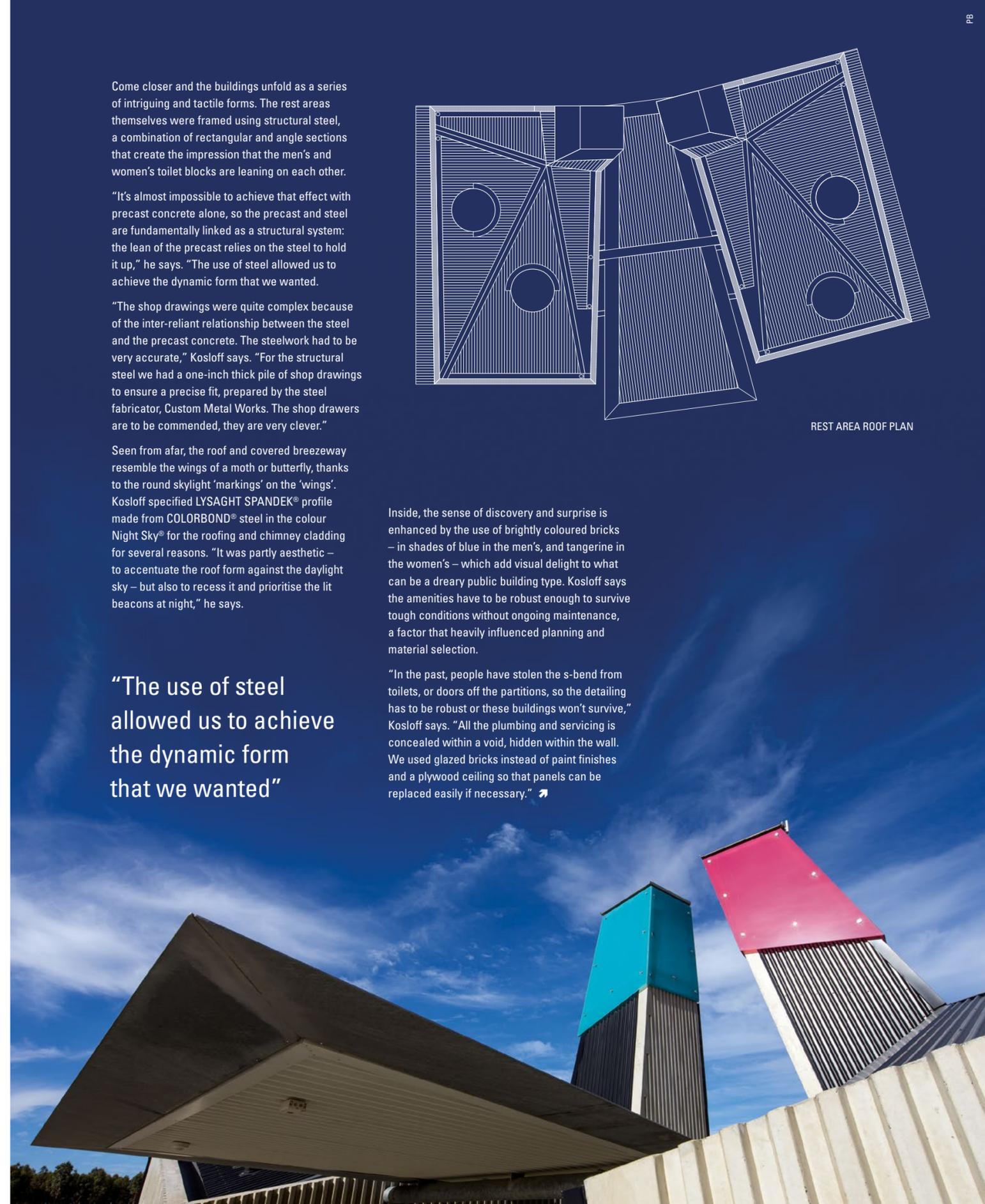
"The use of steel allowed us to achieve the dynamic form that we wanted"

Inside, the sense of discovery and surprise is enhanced by the use of brightly coloured bricks – in shades of blue in the men's, and tangerine in the women's – which add visual delight to what can be a dreary public building type. Kosloff says the amenities have to be robust enough to survive tough conditions without ongoing maintenance, a factor that heavily influenced planning and material selection.

"In the past, people have stolen the s-bend from toilets, or doors off the partitions, so the detailing has to be robust or these buildings won't survive," Kosloff says. "All the plumbing and servicing is concealed within a void, hidden within the wall. We used glazed bricks instead of paint finishes and a plywood ceiling so that panels can be replaced easily if necessary." ↗



REST AREA ROOF PLAN



ABOVE: LYSAGHT SPANDEK® profile made from COLORBOND® steel in the colour Night Sky® was used on top of the restrooms, partly to emphasise the lit chimneys at night



PICNIC SHELTER ELEVATIONS

Each roadside stop also incorporates two other buildings – a covered picnic shelter reminiscent of BKK’s shelters at the Australian Garden at Cranbourne (see *Steel Profile* 116) and a carport suitable for long and tall vehicles. In a further attempt to elevate these structures beyond the ordinary, the carport’s underside was lined with LYSAGHT SPANDEK® profile in a chequerboard pattern made from COLORBOND® steel in the colour Night Sky®, COLORBOND® Coolmax® steel in the colour Whitehaven® and COLORBOND® Metallic steel in the colours Axis® and Facade®.

“A road graphic pattern creates an interesting underside to the carport, which also boasts leaning steel columns that evoke a sense of movement,” Kosloff says. “We wanted to add interest to a typology that historically has been pretty plain.”

All of these whimsical elements combine to create an attractive destination in its own right where drivers and their passengers can break a road trip, and one that is innovative in its service delivery as well. “The entire facility is off-the-grid, powered by photovoltaics with battery backup for the lighting, which is on sensors and timers,” Kosloff says. “Rainwater for the toilets and basins is collected off the roof and sewerage is treated and filtered on-site. There is mains water back-up for higher-than-expected usage and that’s already been utilised, which demonstrates the project is working as it was intended, encouraging people to leave the road and take a break.”

Kosloff is incredibly proud of this project, despite its diminutive size. “The lit turrets are very successful,” he says. “As you drive towards them at night they present an unusual sight. By day, they reveal an altogether different reading. The level of detailing in the project is very resolved as well, a factor that will pay off over time.

“There is a level of playfulness to the project, but each element has been considered carefully from a functional and environmental perspective”

“There is a level of playfulness to the project, but each element has been considered carefully from a functional and environmental perspective,” he adds.

Playful, yet practical. Beautifully detailed but surprisingly robust, the form incorporates many references yet the brief springs from a singular vision: to combat driver fatigue and reduce the road toll. For that reason alone, these are important buildings despite their modest size and perfunctory role. Even if they don’t attract quite the same fervour as pilgrims take to Ronchamp to admire Corb’s masterwork, if they are sufficiently intriguing from a distance to tempt drivers to stop and investigate, and enjoyable enough to encourage repeat visits on subsequent trips, they have more than fulfilled their civic duty. **SP**

*Source: www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-road-safety/truck-stops-and-rest-areas

ABOVE: Like the restrooms, the covered picnic area boasts a dynamic form that conjures up images of speeding through the landscape in a vehicle

PANEL SAYS

The elegance of this structure is almost fabric-like – a canopy made up of a series of fine threads on a loom – which defines an inviting outdoor space. The canopy acts as a development anchor and investment in infrastructure that precedes a new suburb, and the entire project demonstrates deft resolution. We admire the slender battens that immerse the amphitheatre in a strong pattern of sunlight and the fine details – in the junctions between column and beam, and between canopy and café, for example – but the great strength of this project is in the quality of the public space it creates



The carport ceiling combines four COLORBOND® steel colours in a chequerboard pattern as a riff on graphic road signs, and the columns lean outwards to “evoke a sense of movement”



PROJECT Geelong Ring Road Rest Areas **CLIENT AND LANDSCAPE ARCHITECTS** VicRoads **ARCHITECT** BKK Architects **ARCHITECTURAL PROJECT TEAM** Julian Kosloff, Simon Knott, Tim Black, Stephanie Bullock and Madeleine Beech **STRUCTURAL & CIVIL ENGINEER** Perrett Simpson Stantin Consulting Engineers **STEEL FABRICATOR AND SHOP DRAWING CONTRACTOR** Custom Metal Works **CLADDING CONTRACTOR** Geelong Roofing **PRINCIPAL STEEL COMPONENTS** Rest Area roofing: LYSAGHT SPANDEK® profile made from COLORBOND® steel in the colour Night Sky®, COLORBOND® Coolmax® steel in the colour Whitehaven® and COLORBOND® Metallic steel in the colours Axis® and Facade®. Structural steel: RHS, SHS and various angle sections supplied by BlueScope Distribution **PROJECT TIMEFRAME** Six months **AWARDS** 2014 National Australian Institute of Architects Awards: Shortlisted for Small Project Architecture. 2014 Victorian Australian Institute of Architects Awards: Architecture Award for Small Project Architecture **BUILDING SIZE** Rest Area 110m²; Carport 110m²; Picnic enclosure 25m²

Somehow this house with its bold steel framing and colourful screens seems to both stand out and blend in, to be part of a beautiful Tasmanian landscape.

Words **Paul McGillick** Photography **Peter Whyte**

PARADISE FOUND

ARCHITECT
Misho + Associates
PROJECT
Premaydena House
LOCATION
Premaydena, Tasmania

In Tasmania, the narrow road to the deep south – namely Eagle Hawk Neck and beyond to Port Arthur – has been the location for some fascinating architectural experiments. Like writers such as Richard Flanagan and Nicholas Shakespeare who have looked to Tasmania for their subject matter, Tasmanian architects have found the landscape and the climate of the island state a source of inspiration for some highly innovative residential architecture – much as New Zealand architects have done – resulting in an increasingly distinctive ‘school’ of regional architecture.

This is a form of ‘critical regionalism’ that marries modernist principles with the character of a particular place. Like the broader Australian critical regionalism (for example, the Sydney School) it typically embraces a Japanese aesthetic, not in any scenographic sense, but by way of its underlying principles: structural practicality, simplicity of planning, refined materiality and engagement with the landscape. The unity of house and landscape is crucial.

Such is the case with this house at Premaydena, near Eagle Hawk Neck. Set in a breathtakingly beautiful Arcadian landscape of rolling farmland and forested hills with a sublime view of Norfolk Bay, this house is a subtle re-purposing and a thoroughly appropriate application of the Japanese aesthetic in a distinctly different climate and landscape using contemporary materials, notably steel.

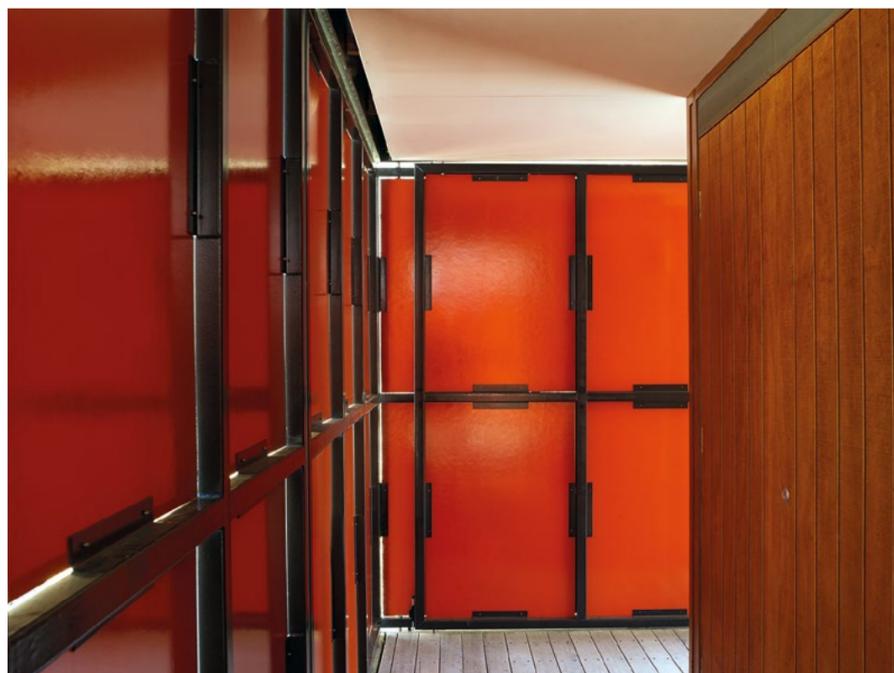
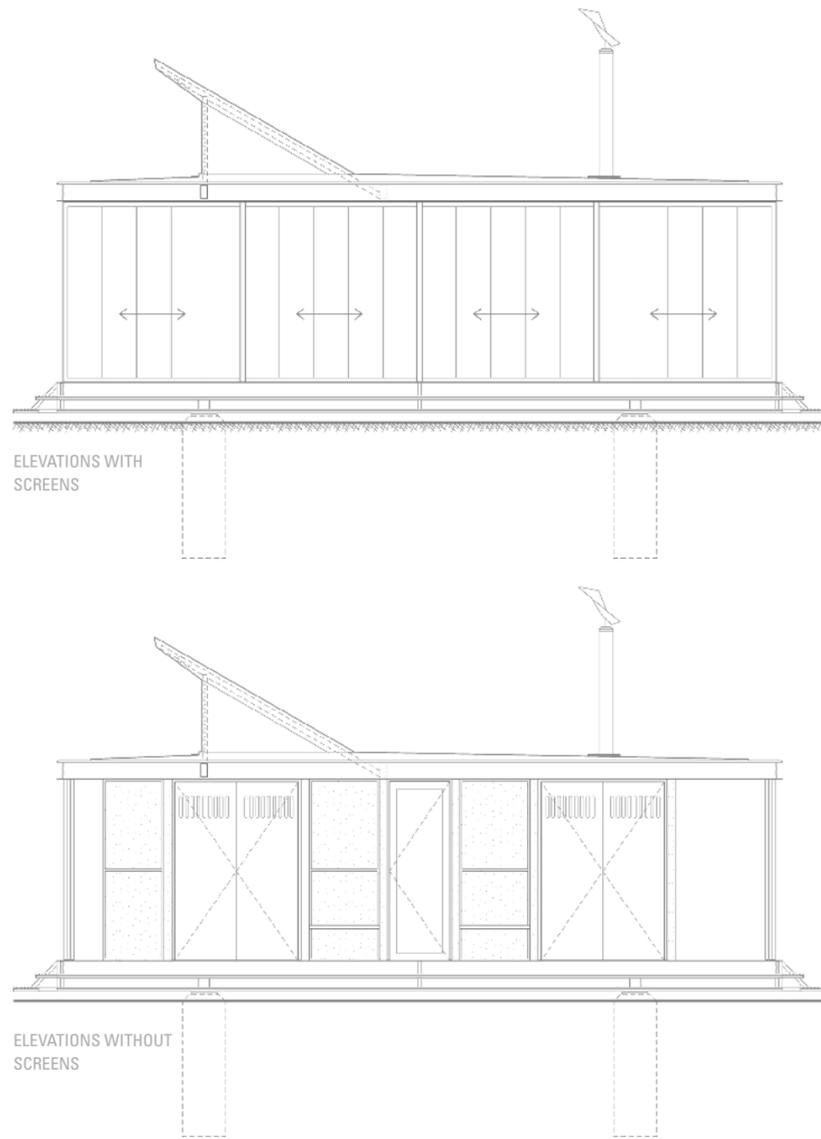
Architect Misho Vasiljevich is himself a refugee from Sydney and had previously designed a house in Sydney’s Balgowlah for the same clients in 2005.

Deeply committed to a sustainable agenda, Vasiljevich designed a home/studio for himself in Tasmania’s Huon Valley, a “box” as small as possible and measuring a mere 40m². His own house optimises space inside and adapts to the climate outside using colourful sliding screens of BlueScope galvanised steel reminiscent of Japanese *shoji* screens.

His clients saw that house and said they wanted something like it on 19 hectares of land they had purchased at Premaydena. The result is a box within a box. The outer box is formed by sliding metal screens which wrap around a four-sided verandah, a transitional space to the interior which in turn consists of two modular six by six-metre volumes (living/dining/ kitchen and bedrooms) separated by a six by two-metre wet area including ensuites and laundry.

Facing north, the house is set on a kind of podium or ridge halfway up a steep hill. Above the house, the hill is densely forested by eucalypts which shield the house from the chilly southerly winds driving up from the Great Southern Ocean. However, the wind can also come from the north-east. This can be gusty and carries salt, moisture and cold from

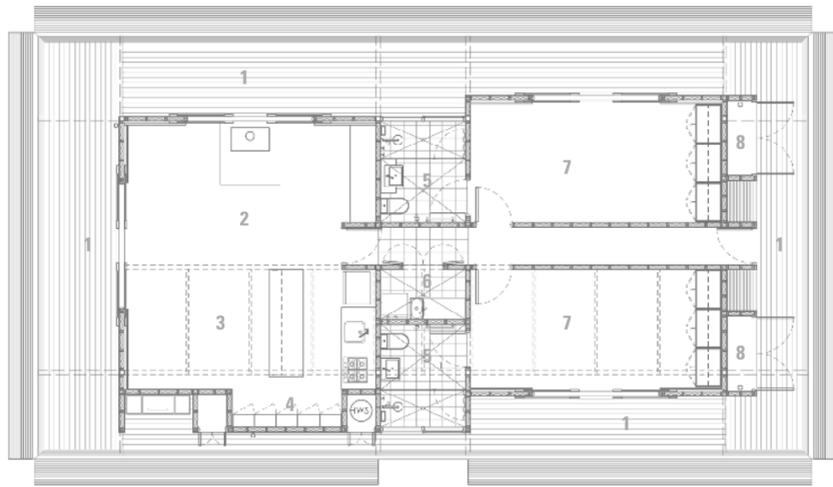
RIGHT: When closed, the screens seal off the interior cell of the house, helping to insulate it from the weather



With its elevated position and brilliant orange- and red-finished panels made from BlueScope galvanised steel sheet, the house is an unapologetic punctuation mark in the rolling green landscape



The Japanese aesthetic is supported by the way the house sits on the ridge halfway up the hill, giving it an emblematic quality



FLOOR PLAN



LEGEND

- 1. Decking
- 2. Living
- 3. Kitchen/Dining
- 4. Pantry
- 5. Ensuite
- 6. Laundry
- 7. Bedroom
- 8. Storage



An example of the lichen-infused rock from Norfolk Bay which is echoed in the russet orange of the screens

for example, sitting on the north side with a good book or chatting to friends over drinks on the west side before sitting down to dinner.”

For Vasiljevich, the house also conjures up memories of the Japanese *chashitsu*, or tea house, with its refined ceremonial interior, celebrating everyday rituals. The modularity of the house also lends it a sense of order associated with the *chashitsu*. The windows all align with the parted screens and the interior is marked by elegant simplicity and the soft light drawn in through the south-facing highlight windows.

The project had a modest budget that was stretched by the hilly site and the decision to create a more direct secondary road as insurance against bushfires. Otherwise, the aim was to minimise any disturbance to the existing landscape.

The budget and the hilly terrain meant that constructability became an issue. The solution was a pre-fabricated, modular steel system. The new road facilitated materials delivery and for a crane to come on site and erect the steel structure. Manufacturing off-site meant a fixed price, thus minimising the costs of labour on a site as remote as this. With everything fabricated and pre-painted off-site, the entire steel structure was erected in two days.

For speed, efficiency, affordability and fire protection – and after experimenting with other products – Vasiljevich decided that steel was the clear choice

Norfolk Bay. Hence, the screens provide protection from the weather while also providing security when the Sydney-based clients are away, together with a reasonably high degree of protection from bushfires.

With its elevated position and brilliant orange- and red-finished panels made from BlueScope galvanised steel sheet (a reference to the ubiquitous lichen-infused rocks of Norfolk Bay), the house is highly visible from the road – an unapologetic punctuation mark in the rolling green landscape surrounding it.

While the screens offer protection from cold winds, they also keep out the heat of the afternoon sun. When closed, they protect the “cell” of the house from the outside weather conditions. But when open, they allow the house to engage fully with the magnificent surrounding landscape.

The *shoji* screens set up the Japanese aesthetic. This is continued by the deck which wraps around all four sides of the building. The deck with its three steps recalls the Japanese *engawa*, a transitional space to the interior, but also a place where people gather together, perching on the steps and looking out to the view. “Because it is all around,” says Vasiljevich, “there is no definition – it is just a case of where you are and what you are doing –

“Steel is the better material because it resists the weather, it’s durable and can be produced in a whole piece”

for the house’s structure. “Steel,” he says, “is the better material because it resists the weather, it’s durable and can be produced in a whole piece.”

It was also important to get a high-quality finish, one that would “retain its integrity” over time. The exposed steel sliding frame, made from 50 x 50 SHS, is hung on Henderson® runners and finished in Jotun® charcoal grey paint, specifically developed for environments with high corrosivity.

The steel panels supplied by Crisp Brothers were cut from galvanised sheet steel and painted using Dulux® “Chinatown Orange” and Resene® “Dynamite Red”.

Vasiljevich points out that there is nothing particularly innovative about moveable screens, but steel itself is highly malleable and “you can create a myriad of different things”, he says. In this case, steel offered the possibility of a lightweight building, slightly elevated to allow for the sometimes water-steeped ground underneath and as another strategy to reduce the potential impact of a bushfire on the house. The elevated level platform also made it easier to insert underfloor insulation.

Locally sourced and milled eucalyptus hardwood was used for the deck, framing and interior flooring, setting up a rich counterpoint with the house’s exterior which celebrates its steel structure and plays so exuberantly with colour.

And the clients love it, says Vasiljevich. “They’re ecstatic. Originally they had planned to come down at Christmas. But now they come down roughly every six weeks and stay for two-to-three weeks. They drive from Sydney and take a ferry across. They work from their home in Sydney and now work remotely from Tasmania as well.”

It is all about the view and here the sliding screens are complemented by the highlight windows that not only draw in additional light, but also provide alternative views. “When you are sitting in the lounge area,” says Vasiljevich, “you can look out to the view, but you can also look up – through the clerestory – to where the eagles are, circling between the apex of the window structure and the brow of the hill.” **SP**



This construction shot highlights the simplicity and lightweight character of the building’s steel structure

PANEL SAYS

Inspired by Japanese tea-houses, this modest retreat uses steel framing and sliding steel screens to great effect. Colour-matched to a local lichen, the orange screens are at once highly visible yet beautifully integrated into the landscape palette. And whereas the Granny Flat (see page 28 of this issue) embraces its sub-tropical climate and beachy location in Queensland with a casual openness, this carefully layered architectural response is ideally tempered for its rugged Tasmanian site, where the weather can change dramatically and quickly. Pull back the screens and every room opens to the view, or close them over to create a warm cocoon inside with the combustion stove ablaze.



The window and door openings align with the screen openings to frame views of the ‘borrowed’ landscape

PROJECT Premaydena House **ARCHITECT** Misho + Associates **PROJECT TEAM** Misho Vasiljevich, Joe Hitti **INTERIOR DESIGNER** Misho Vasiljevich **STRUCTURAL ENGINEER** Aldanmark **ENVIRONMENTAL CONSULTANT** Geo-Environmental Solutions **BUILDING SURVEYOR** Pitt & Sherry **BUILDER** Brett Perry **STEEL FABRICATOR** Crisp Brothers/Hayward **SOLAR/PLUMBING** HyrolSol **GUTTER** Hill Sheet Metal **PRINCIPAL STEEL COMPONENTS** Exposed and concealed structural frame supplied by BlueScope Distribution in sizes: 75 x 50 x 3 RHS, 125 x 4 SHS and 50 x 3 SHS, and 200 PFC and 250 PFC. External fixed and sliding screens use standard 50 x 50 SHS frames with galvanised panels cut from BlueScope sheet steel with a paint finish to all sides and surfaces **GLAZING** Double-glazed windows from Glass Supplies Tasmania **BUILDING SIZE** House 70m², house and deck 120m² **TIMEFRAME** Designed in 2010. Completed in October 2013 **AWARDS** Commendation for a new house under 200m² in the 2014 Houses Awards **PROJECT COST** \$512,722

NG SEK SAN

As a student, Ng Sek San chose landscape architecture to further his aspirations in student politics and to stay in New Zealand. Twenty-five years later, he is still using the discipline to bring about social change, albeit closer to home in Malaysia.

Words **Rachael Bernstone** Photography **Charles Pertwee** (portrait)

Many of Ng Sek San's projects are unlike anything you've ever seen before and his career path is also highly unorthodox. Born in Malaysia, he completed high school studies in New Zealand before commencing a civil engineering degree, during which time he became active in student politics. "To carry on my leadership role I had to do post-graduate studies to stay in the country, so I actually tripped into landscape architecture that way," he says. After graduating, Sek San worked in landscape architecture in New Zealand and Singapore before returning to Malaysia, where he established his own practice in 1994.

"I started my working life in New Zealand, and I was working on cultural conservation and natural conservation, but when I got back to Asia it was a whole different ball game," he says. "It was all about building, and building fast. I travelled to many parts of Asia to design projects which informed my later development and rooted me back to something."

During the early years of the practice, Sek San travelled widely and oversaw landscape architecture and urban planning projects across residential, commercial and hospitality sectors, in countries as diverse as China, Thailand, Indonesia and Vietnam, as well as Malaysia.

Where he initially found the teachings of 'western gurus' to be highly influential – people such as US landscape architect and artist Martha Schwartz, known for her approach to regenerating urban sites and city centres – he later started to embrace the ideas of architects and landscape architects working closer to home.

"I tapped into some Asian gurus such as Geoffrey Bawa, and also Glenn Murcutt, people who are very respectful and only work in their own country,"



DAVID LOK STUDIO

ABOVE: The first Sekeping resort project – Sek San's own retreat – used ZINCALUME® steel cladding and structural steel to create the Glasshouse tower in a rural forest

BELOW: The SekSan Design office in Kuala Lumpur embodies the landscape architect's approach of creating buildings that are integrated with nature

he explains. "Because they work in significant environments, they understand so much deeper than a lot of us who travel around the world trying to get the essence of a country or its people. That realisation made me pull back and focus on the local."

Sek San admits that when he returned from his overseas studies he found little in the way of a Malaysian landscape tradition to refer to, but says that void gave him freedom to experiment and invent a culturally appropriate response. Like his gurus, he favours a light touch, the use of readily available materials, indigenous plants, and local arts and crafts.

For the past few years, Sek San has worked mainly in the Kuala Lumpur area. His latest projects fuse

"We wanted a dry construction method and I wanted it to be non-obtrusive, so we opted for steel as the strongest and lightest material"



CHARLES PERTWEE

landscape, architecture and urban planning to create new community assets that foster engagement and link people, nature and commerce in unique and inspired ways. With a youthful energy and infectious enthusiasm for his profession, Sek San describes himself as "a political activist and social agent for urban planning and landscape architecture" and he's now looking to self-fund projects that have the capacity to create real change.

Some of his most recent and alluring projects – including several where Sek San was developer, client, designer and chief experimenter – combine buildings and landscape in a seamless union. One of these is the Glass Shed at Sekeping Serendah, a private retreat on a steeply sloping site that Sek San built for his own use before offering it for rent to friends, and then members of the public.

"It was also to demonstrate that we can build on very steep forested land without the need to destroy too much," he says. "Sekeping Serendah"



ABOVE: At Sekeping Kong Heng in Ipoh, a floating glass bedroom was suspended within the original neo-classical structure

RIGHT AND TOP RIGHT: The steel-framed stair at Kong Heng ties in with the mesh screens that now enclose the upper floors

BOTTOM (AND BOTTOM OPPOSITE): Serendah Warehouse fuses found objects, fast-disappearing building crafts and blurs an edge between building and landscape to create a unique retreat

RUPAJIWA STUDIO



RUPAJIWA STUDIO



RUPAJIWA STUDIO

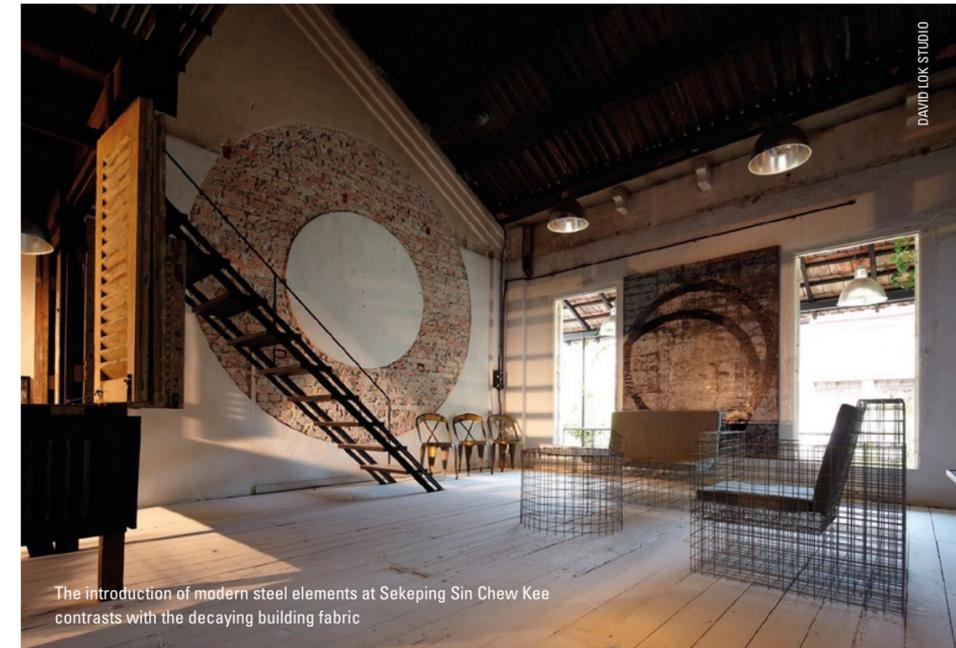
was built with the philosophy that if we treat the land gently, the land will in turn take care of us. It is just a modern take and extension of our 'Orang Asli' neighbours' house."

The buildings blend into their jungle surrounds thanks to the use of slender steel columns and lightweight cladding, and roofing made from ZINCALUME® steel. "We wanted a dry construction method and I wanted it to be non-obtrusive, so we opted for steel as the strongest and lightest material," Sek San says. "The cladding was very easy to bring in, and in a forest environment where the weathering is extreme, timber is not appropriate because of termites and dampness, so it's a combination of glass and ZINCALUME® steel, covered with plants."

Another project in the Sekeping series is Kong Heng, a hotel inserted into a three storey neo-classical building – which houses a famous coffee shop on the ground floor – in Sek San's home city of Ipoh. As a part owner of the project, he eschewed obliteration of the heritage structure in favour of preservation. The floating glass bedrooms are carefully suspended among original timber beams, trees that had grown up inside are retained, and the top floor is transformed into an open-air penthouse with mesh screens instead of walls.

His current projects push the boundaries of architecture, landscape and social change even further. Having completed the construction of an orphanage funded by donors in northern Thailand, overseen the sprouting of an art project called Malaysian Spring (which encouraged ordinary people to make and plant paper flowers and then share photos of them on social media), he recently overhauled one of KL's last remaining 1920s colonial row houses as a retreat with an ethically-minded cafe/bar inside. He continues to seek out projects that allow him to keep agitating, designing and building to create real improvements for local communities where he lives and works.

"I'm working to transform some dilapidated land in KL into a linear park to be operated by the community," he says. "It's never been done before in Malaysia, so this is a test case to see how successful it can be."



The introduction of modern steel elements at Sekeping Sin Chew Kee contrasts with the decaying building fabric

DAVID LOK STUDIO

There are nine acres of land and we'll have allotments for permaculture, and for rice paddies, because in Malaysia we have lost that culture and we want to bring it back into the city alongside new playgrounds and accommodation."

Sek San admits that these socially-orientated projects are the most challenging of his career so far, but that just adds to their appeal. "The most challenging project is the one with the most stakeholders," he says. "A normal commercial project has a standard path. It's a bit like a cookie cutter – you just go through the process – but with these types of community projects that are self-funding I'm learning new things all the time."

As his focus moves from commercial to social, so too have the sources of his inspiration shifted, he says. "I used to have a lot of heroes and architectural role models, but more and more I am finding inspiration in ordinary people's

lives and the environment that they live in," he explains. "So the roles of my heroes are diminishing as I am being re-educated on the aesthetics of the third world that I operate in. It is almost no longer relevant for me to talk about role models now."

There is an emerging philosophy that drives his current practice and approach, but Sek San shies away from calling himself an environmentalist or a sustainability expert. "In a way, I'm still searching, so my approach is kind of evolving," he says. "It's built on a philosophy of simplicity, and the Buddhist philosophy of imperfection, and undesigning things rather than always adding more."

"As for the issue of green building, there are some people who claim to be building environmentally driven cities, but I think we need to be a bit more transparent about this whole issue of environmentalism."

Standing off to the side of the current global trend of green building and environmental design, Sek San prefers to draw upon his international education, more than two decades of professional experience across the Asian region, and a long-held desire to agitate for real and lasting change to dream up, develop, document – and in many cases fund – projects designed to benefit local communities. Whether tangible or ethereal, or a skilful mix of both, every concept and project that Sek San touches begins with the intention of making a difference, just as it did when he was a student. SP

"... in a forest environment where the weathering is extreme, timber is not appropriate because of termites and dampness, so it's a combination of glass and ZINCALUME® steel..."



DAVID LOK STUDIO



DAVID LOK STUDIO

MATERIAL SYMBOLISM

In a region where history, industry and identity are resolutely intertwined, this new retail project imagines an alternative future for its city.

Words **Micky Pinkerton** Photography **Brett Boardman; Paul Bradshaw**

ARCHITECT

HDR Rice Daubney

PROJECT

West Keira (Building 1) Wollongong Central

LOCATION

Wollongong, New South Wales

From its stunning beaches to the dramatic escarpment that runs its length, the South Coast of New South Wales is widely acknowledged for its natural beauty. Standing at its gateway, Wollongong has been home to major mining and heavy industry – including steel-making at southern satellite, Port Kembla – for more than 100 years.

This contrast between the lush coastal bush and the gritty urban environment was the starting point for the architects of 'West Keira', a new extension to an existing retail centre in the heart of Wollongong's central business district. Key to HDR Rice Daubney's successful bid and interview for the project was its understanding and passionate articulation of these juxtapositions.

"A lot of people had a very personal investment in the building and the client, like us, understood it was an opportunity to do a nice piece of architecture," explains architect Susanne Pini. "But over and above that, both groups were saying 'What else could this do? Could this actually start to enliven parts of the city? Could this start to bring people into the city who would normally say 'Why would we bother going there?'"

As head of retail and town centres at HDR Rice Daubney, Pini has spent the past two decades creating spaces which reflect a place and its people, eking out their stories to inform overall design, negotiating narrative and myth. From the start the client – GPT Group – was clear that an important thread of this project's story was the region's central role in Australian steel-making.

As the daughter of an Italian immigrant who spent his life working in the Port Kembla steelworks, it's a narrative – and a mythology – that Pini knows well. She had a personal understanding of the prosperity the industry brought hers and countless other families who had escaped poverty in post-war Europe. But 20 years of studying and living in Sydney had also made Pini aware of the negative perceptions of outsiders towards Wollongong, seeing it as a one-dimensional 'Steel City'.

In many ways it was an almost impossible brief set by client and architect: to revive an unloved part of town, reflect the aspirations of a proud community, reverse long-held misconceptions, celebrate the region's environmental beauty as well as its industrial landscape, and find a way to express this visually and materially.



SOUTHERN ELEVATION

Starting with the key idea of the contrast between the natural and the man-made, the architects conceptualised the Keira Street facade as a series of craggy, jagged forms, evoking the iconic escarpment that runs the length of the city. This hard, faceted exterior of glass-reinforced concrete is softened by a digitised pattern of Illawarra Flame Tree buds that have been stamped into the concrete.

Turning the corner into Crown Street, a shroud of 750 blades made from 2000 square metres of XLERPLATE LITE® steel masks the building's southern elevation, introducing the man-made theme and replicating the initial pattern of settlement in the area. Moving around the building at ground level, the blades appear as a solid wall of oxidised steel from side on, before opening up once you are standing front on, to reveal the retail space within. The effect is one of movement, of sweeping up along Crown Street, of being drawn in and encouraged to explore further to the west.

Pini was intrigued by these expressive qualities of the material. "Steel is usually used as a fairly rigid material, both visually and physically, so we had an idea of using it in 'impossibly' fine ways, almost in a way that's lyrical and delightful, and playful. The steel blades put up different vistas and different rhythms, before they march into a sensual timber interior. We felt that it was a logical place to use steel because it could be presented in a very heroic way, a very civic way, and the gesture to the quarter is really about a civic quality."

The architects had initially considered using a cold-rolled weather-resistant steel for the blades, a material that requires adequate drainage solutions

for oxidised run-off. For such a high foot-traffic area and in this case the main entrance, an alternative was sought. The team instead specified HA250 XLERPLATE LITE® steel finished in iron oxide-style paint.

"The stability of the colour was actually part of the product. We wouldn't have the issue of leaching, but we would still get that amazing kind of 'outback red', which was a very good contrast to the more muted colours that sit around it," says Pini.

The blades are the building's most obvious reference to the city's steel past and present, but the material can be found throughout the project, from the structural members, plate product used in window sills and external skirting, to the DECKFORM® steel integral to the building's structure. The architects and builder were encouraged by the client to consider using local steel products wherever possible.

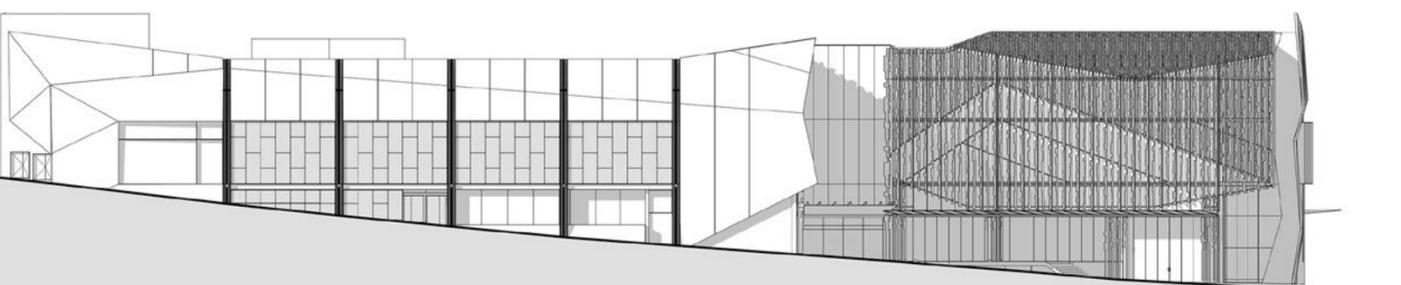
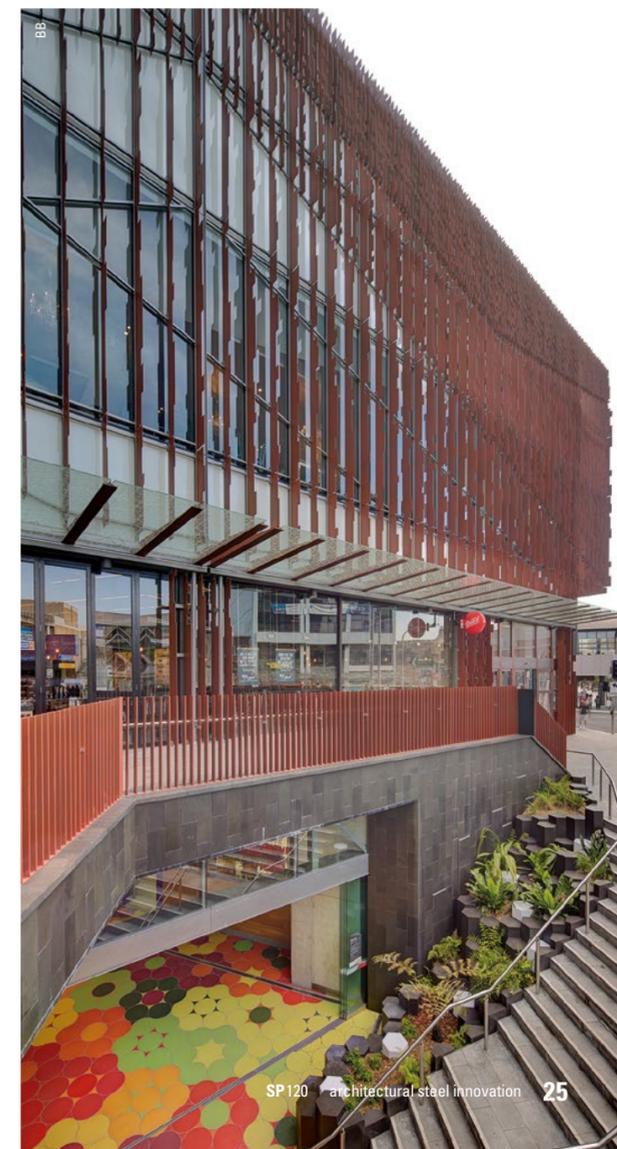
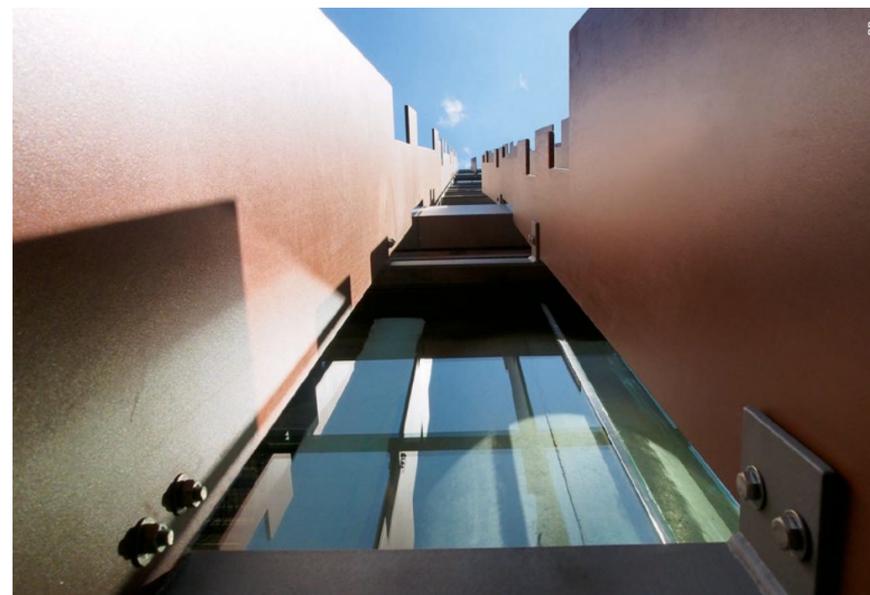
"The steel blades put up different vistas and different rhythms, before they march into a sensual timber interior"



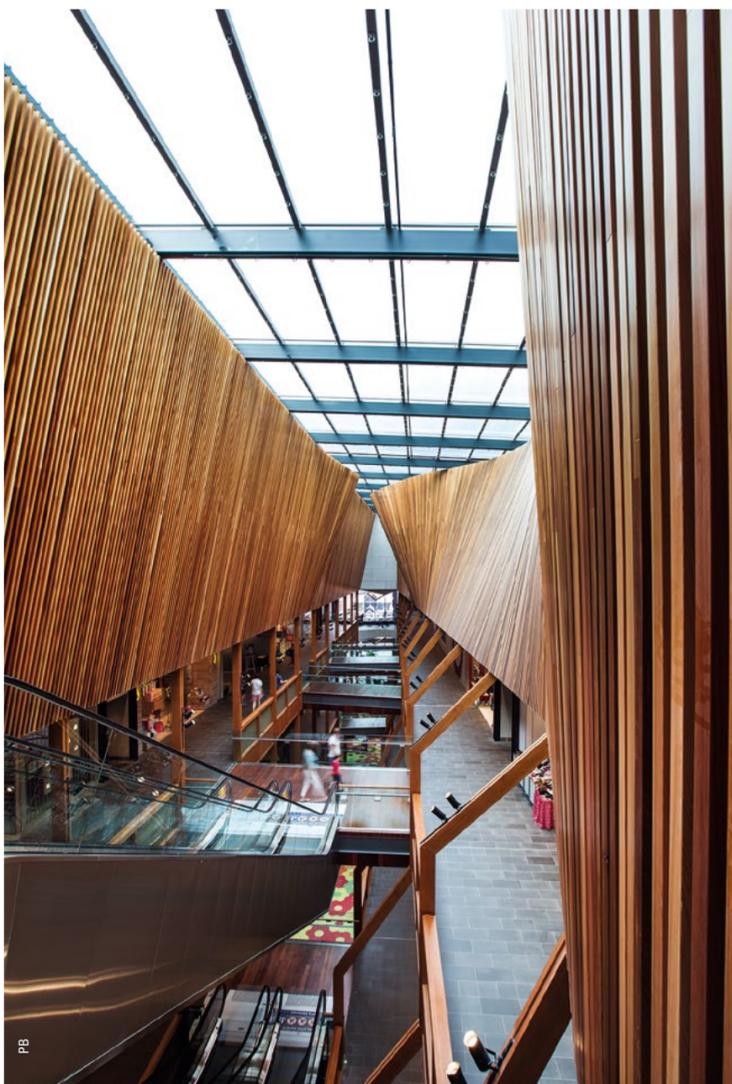
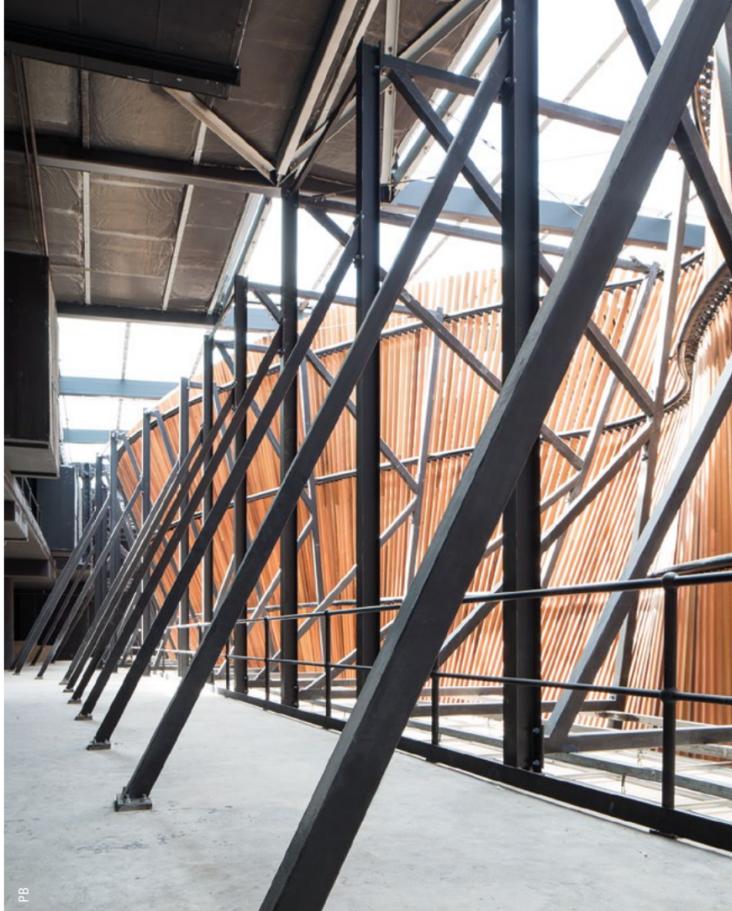
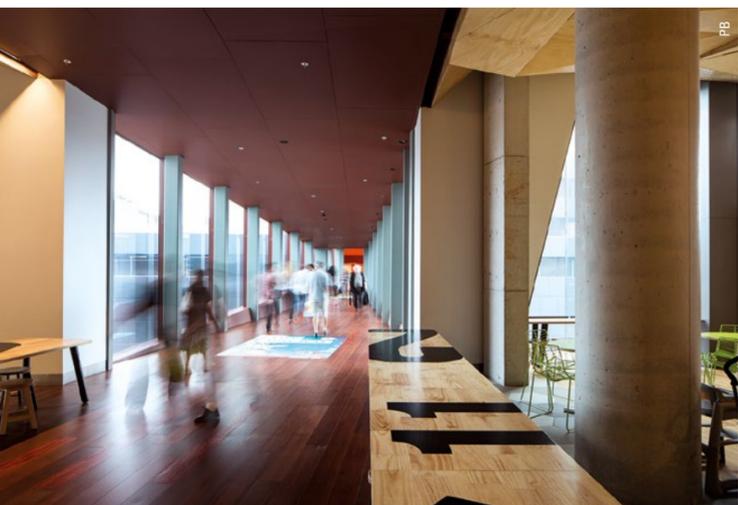
ABOVE: The visual rhythm of the steel blades draws the eye into the south-facing entrance of the building, which is located on a significant gateway site in Wollongong's CBD

RIGHT AND FAR RIGHT: The blades appear as a solid wall of oxidised steel from side on, before opening up to reveal the retail space within

BELOW: Made from HA250 XLERPLATE LITE® steel, the blades were finished in iron oxide-style paint to mimic weathering steel



SOUTHERN ELEVATION



TOP LEFT: Internally, abundant timber panelling provides a contrast to the steel and concrete exterior

TOP RIGHT: A steel frame supports the impressive timber wave which crests above the retail spaces

ABOVE: A footbridge joins the new building with the existing shopping centre

RIGHT: Steel also supports an expansive atrium that floods the building with natural light



Low-Glare Coated DECKFORM® steel in construction at Wollongong Central. BlueScope fast-tracked the product's development for the project, where it was used for the first time

GPT development manager Steven Turner drove this agenda into all aspects of the building's construction, leading to a partnership between designer, construction team and supplier.

"The builder worked with us to investigate what products were available and question through the supply chains as to where we could use such products," explains Turner. "BlueScope brought the innovative Low-Glare Coated (LGC) DECKFORM® steel product to the table, as a product that was in the process of being released to market, and fast-tracked that process to ensure that it could be used on Wollongong Central."

The project therefore saw the first large-scale use of Low-Glare Coated (LGC) DECKFORM® steel. In addition to being locally produced, the product – roll-formed in Fielders KingFlor® profile – also has numerous construction attributes which delivered further benefits for the project. As an alternative to ply for concrete formwork it saved time thanks to the longer spans possible compared with timber, and by not having to remove the formwork after the concrete was poured.

Project manager for builders Hansen Yuncken, Stuart Hodgson, said speed of construction was a key consideration in specifying LGC DECKFORM® steel in Fielders KingFlor® profile. "It's quicker to lay because you can run longer spans than with plywood, which tops out at 2.4 metres by 1.2 metres," said Hodgson. "The KingFlor® KF57 composite steel formwork we specified for the job is three metres wide and you can usually run spans of four-to-five metres, un-propped. Across this job, the average span length was about eight metres.

"We also saved a lot of time because we didn't have to strip steel decking once the concrete was formed."

And because the DECKFORM® steel remains in place, it provides additional tensile reinforcement. The construction workers also appreciated its lightness and low-glare properties, which make it safer and more comfortable to work with.

With the building now complete, Pini says community response has been overwhelmingly positive and has "literally taken our breath away". She spent a number of days in the centre around the opening and overheard many comments from shoppers about the quality of the space and light, and was delighted to see people in the forecourt looking up at the blades, intrigued by the apparent movement of the facade as they walked past the building.

There is a clear engagement with the architecture, but has that engagement extended to the neglected western end of Crown Street? Pini says that in the last year of construction a seed culture started emerging with pop-up businesses and small bars. "That wouldn't have happened if the site that we built on didn't do the right things in terms of the city," she asserts.

Many buildings are conceived of as 'catalyst' projects. It's heartening to see one that actually delivers on that point, for a place and a people for which and whom it was likely unexpected, yet certainly deserved. The project serves as an obvious example of the region's reinvigoration and an ongoing symbol of economic optimism, which is fuelled by continued heavy industry investment and wider diversification into the fast-growing sectors of health care and tertiary education.

For the people of Wollongong, West Keira at Wollongong Central provides more than just a new place to meet, dine out, shop and socialise. It's a building that reflects the town's proud history and points to a bright future. **SP**

PROJECT West Keira (Building 1), Wollongong Central **CLIENT** GPT Group **ARCHITECT** HDR Rice Daubney **PROJECT TEAM** Susanne Pini, Jason Roberts, Lionel Kettler, Ciaran Durney, Sandra Stewart, Graham Steer, John Peachey, Elizabeth Clark, David Hart, Kylie Soltani, Simon Grimes, Jonathan Lindsay, Jonathan Croft, Stephen Auld, Graham Reynolds, Robert Byrne, Stephan Langella, Stefano Cottini, Tins Turrisi and Simon Grimes **STRUCTURAL ENGINEER** Enstruct **CIVIL ENGINEER** Hyder **BUILDER** Hansen Yuncken **STEEL FABRICATOR** Wexford Welding **CLADDING CONTRACTOR** AGP **LANDSCAPE ARCHITECTS** JMD Design **PRINCIPAL STEEL COMPONENTS** 30,000m² Low-Glare Coated DECKFORM® steel in Fielders KingFlor® profile; 1500 lineal metres of Z&C purlins and girts made from GALVSPAN® steel; 2000m² of XLERPLATE LITE® steel **PROJECT TIMEFRAME** October 2011 – October 2014 **BUILDING SIZE** 60000m² **TOTAL PROJECT COST** \$200 million

"Low-Glare Coated DECKFORM® [is] quicker to lay because you can run longer spans than with plywood... Across this job, the average span length was about eight metres"

PANEL SAYS

It's unusual for a shopping centre to explore so many different ideas and connections in its design and construction, and this one is of particular interest to us thanks to its location in Wollongong, a town at least partially defined by its 'Steel City' heritage. The architects have deliberately reduced the scale of the building to create a diverse streetscape and usable public space at the corner, where none existed before. The steel fins above the entrance both reflect activities at the nearby port and across the city more widely, and draw people towards and into the building. There are many rich design ideas working in harmony here to create a shopping centre of and for its community



View a video of the architect discussing this project at steel.com.au/steelprofile

BEAT BOX

Clare Design has created a double-storey, steel-clad pavilion for its clients that echoes the lightweight qualities of the traditional Queenslander, without the verandah trimmings.

Words **Peter Hyatt** Photography **Peter Hyatt**

ARCHITECT

Clare Design

PROJECT

Burleigh Heads Granny Flat

LOCATION

Burleigh Heads, Queensland



"We never restrict ourselves to a single facade treatment, but particularise every elevation, every opening and aspect"

The post-war craze for granny flats and bungalows provided a cheap fix for the Baby Boomer generation. Homes bursting at the seams forced the hatching of an 'outer', or other house. However, the lustre of the early granny flat and its promise of independent living quickly faded. Often not great for granny, or anyone else, most fell out of favour, fell over, or quickly filled with household detritus.

Flip forward the calendar a few generations and the granny flat is making a comeback, albeit in a form barely recognisable to earlier generations. Modern times demand modern answers, and that is precisely the outcome when two gun designers take up the challenge.

Better known for their more recent work in New South Wales, the Clares recently returned to their home state of Queensland to design a granny flat. Although they have an office on the Gold Coast, it's a long way from their last celebrated commission in the sunshine state: the Gallery of Modern Art (GoMA). Talk about a shift of gear.

The Clares' clients owned a neighborhood-typical early 1960s timber dwelling. The owners are a young, growing family content with location, but shoe-horned for space. They lacked rear garden privacy and needed additional accommodation.

Enter the Clares who quickly identified an opportunity to create a lightweight steel-clad dwelling to complement the existing timber house.



Just 15 kilometres south of the Gold Coast's sky-piercing outline, this granny flat at Burleigh Heads sits well below the radar, yet is a stand-out with its modular form and luminous skin licked with a few well-placed bright yellow swatches. Working to a highly targeted budget, the solution reflects the Clare's long-term interest in lightweight materials of steel, plywood and glass.

This passion for the considered shape and space informs every aspect of their work, whether the recently opened public library at Melbourne's Docklands, art gallery, or granny flat. To contain construction costs, the flat was conceived as a two-storey next generation ZINCALUME® steel-clad box, framed and braced by plywood 'fin' walls along the perimeter. These fins also form alcoves to create areas for entry, storage or workspace. No internal walls are required for bracing or load-bearing, which allows a high degree of flexibility to the interior spaces and placement of services.

Split across two levels that are connected by a side staircase inside the entry, the principal living space below can be sectioned off, or opened up, with a sliding polycarbonate screen between kitchen and bedroom. A bathroom with shower is neatly concealed against the staircase wall, behind wardrobes. Upstairs is a second bedroom and office area for guests needing a decent workspace.

It's a brilliant solution: cool during the day with breezes drawn effortlessly through the entire building, and sunlight splintered and fanned throughout. Between the granny flat and the main house, a covered deck offers a shared play and gathering space. In the evening, the granny flat's envelope can be adjusted to prioritise security and air-flow simultaneously.

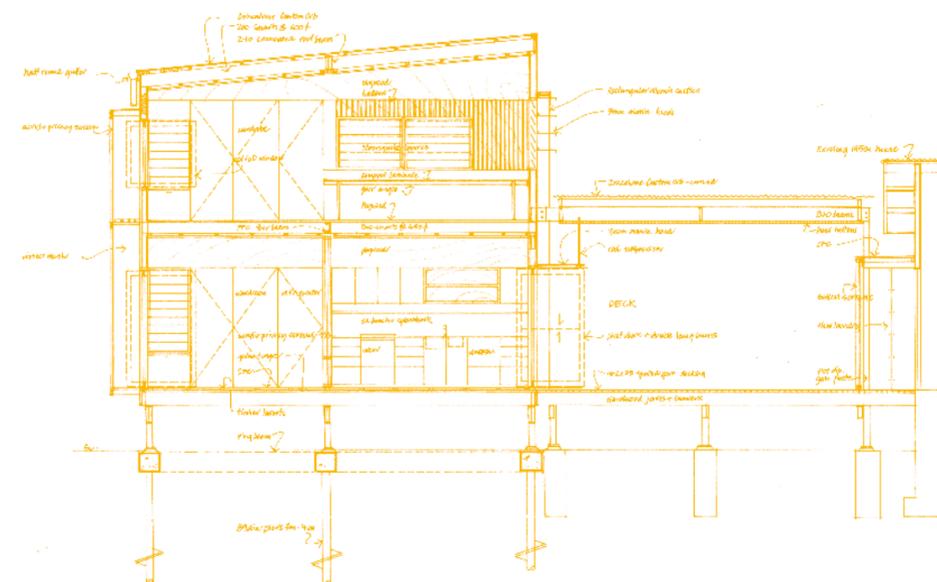
Lindsay Clare explains their preference for a systems approach based on tried and true methods. "It's not ground-breaking architecture in the sense of looking at a new way of building, or a totally different way of using materials," he says.

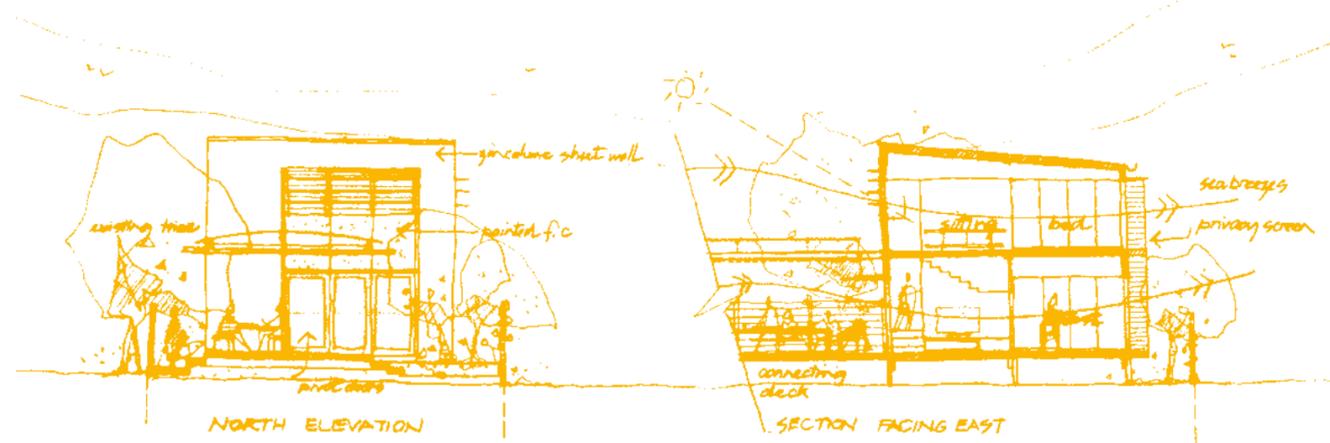


OPPOSITE: The granny flat as a permeable, vibrant abode. Next generation ZINCALUME® steel imparts a pearlescent lustre

TOP RIGHT: Pivot doors enhance light and breeze capture

ABOVE: An expansive, sheltered deck provides complementary visual rhythms that reinforce the pattern of the LYSAGHT CUSTOM ORB® profile's rippled skin





The east elevation reveals another highly specific articulated treatment – notably the lively next generation ZINCALUME® steel in LYSAGHT CUSTOM ORB® profile – rather than flat, dull surfaces



ABOVE: Ground floor bedroom (and amenities) are screened by *shoji*-style sliding panels

RIGHT AND BELOW: The staircase to the first floor office, living space and second bedroom typifies a slender, taut build



“It is basically a sensible, straightforward solution in a seven-metre-square box.”

However, its innovation lies in its rational economy and attempts to address social and environmental concerns.

The re-emergence of the backyard granny flat is a type of “social regeneration”, according to Kerry Clare. “It’s important because it enables a conversation about how to sensibly re-use our backyards,” she says. “This can be a way to better connect with families and guests, yet provide for a degree of autonomy.”

Unlike early granny flats, which were often made from left-over materials, the Clares exhibit scrupulous material selection and assembly. It starts with the watertight shell made from BlueScope’s next generation ZINCALUME® steel – gleaming and rippled with shadow throughout the day. Internally, plywood, operable pivot doors and glazing, and sliding translucent walls reveal a debt to Japanese architecture – seminal in the process of achieving privacy and prospect.

The thinness of the house is itself *engawa*, or Japanese ‘verandah’. In such a culture the tradition extends further to sliding timber and rice-paper screens. Translated to other times and climates this definition and layering of materials is invariably of great interest.

The Clare’s design philosophy responds directly to the fundamentals of client need, climate and landscape. In this respect it differs markedly to solutions that rely on ill-fitting technologies, materials or are steadfastly indifferent to climate.

Those familiar with GoMA – selected as a tour and dinner destination for the G20 world leaders summit no less – will spot the similarity of the

pivoting, broad-bladed riverbank cafe doors and the much simpler, but equally effective, variety used at this granny flat. It’s an uncomplicated strategy that goes way beyond any trick, or style. In practice the doors become wind baffles, capturing and channeling breezes rather than acting as a hard, less manageable single opening.

Kerry Clare is sceptical about the trend towards screening entire buildings with the same external treatment on all sides. “Every elevation, every skin of a building, deserves to be dressed in a way suitable for that elevation and its particular conditions,” she says. “We particularise every elevation, every opening and aspect.”

“[Finnish architect Alvar] Aalto’s work taught us the importance of place and light,” says Lindsay Clare. “The Finns see a special significance in the forest myth, while Australians have this spiritual connection with the Outback.

“Scandinavians bring limited daylight into their houses in a really respectful, generous way,” he adds. “Australia has to deal with very strong light, so we have to manage that very carefully.”

What made them select LYSAGHT CUSTOM ORB® made from next generation ZINCALUME® steel for the envelope? Kerry Clare says their long association with the material instilled great confidence. In the mid-1980s their own house at Buderim was clad in ZINCALUME® steel and helped earn them the first of two Robin Boyd Awards – the highest honour for residential architecture in Australia.

“We were excited about this next generation ZINCALUME® steel. It is a real advance that handles these coastal conditions and we expect it will retain its beautiful lustre for longer.”

PANEL SAYS

Although this is a modest building type (a granny flat), and a fairly simple iteration of that type (a cube-shaped form clad in ZINCALUME® steel) – it boasts limitless capacity to convey happiness and delight. The exterior is plain and robust, with touches of whimsy in bright yellow doors and windows. Inside, the interiors may appear spartan but they are incredibly well resolved, as evidenced by the careful placement of louvred windows, sliding screens that create flexible spaces for multiple users, and beautifully detailed timber and ply joinery, which all combine to create a hidden jewel. We know it was designed for holiday use, but we’d be happy to move in on a full-time basis

During their careers the Clares have resembled a car racing rally team: ratcheting through the gears, shifting between projects large and small, unperturbed by terrain and always with a strong navigational sense.

This granny flat is one of their smallest projects in some time. Because of budget and a raft of constraints, it demanded a purity and reduction of expression. But it benefits from years of experience and problem-solving to result in a harmonious confluence of ideas. This seemingly chunky little cube isn’t so chunky at all. It has all of the luxury that comes with response to climate, place and human connection.

In suburban Burleigh Heads, within earshot of the surf on a clear evening, Clare Design’s Granny Flat brings all of the stars into alignment. SP

PROJECT Burleigh Heads Granny Flat ARCHITECT Clare Design PROJECT TEAM Kerry + Lindsay Clare, David Currie, Britta Wingender STRUCTURAL & CIVIL ENGINEER Mark Traucnieks BUILDER ClareBuild STEEL FABRICATOR Ashmore Welding GLAZIER Window Makers PRINCIPAL STEEL COMPONENTS Roofing and wall cladding made from next generation ZINCALUME® steel in CUSTOM ORB® profile PROJECT TIMEFRAME 2014-15 BUILDING SIZE 98m²



INFINITE POTENTIAL

Resembling a just-landed space ship, this bold new health and medical research facility owes its unique appearance to steel – the only material capable of delivering on its key design objectives.

Words **Rachael Bernstone** Photography **Trevor Mein; John Gollings; Peter Clarke**

ARCHITECT
Woods Bagot
PROJECT
South Australian Health and Medical Research Institute (SAHMRI)
LOCATION
Adelaide, South Australia

When South Australia's health and medical experts teamed up to discuss their plans for a new research institute on Adelaide's North Terrace, they agreed with newly appointed chairman Raymond Spencer that the building had to be iconic, innovative and symbolic of the cutting-edge work taking place inside.

The South Australian Health and Medical Research Institute (SAHMRI) was made possible by a \$200m grant from the Federal Government in 2009, and has so far attracted \$45 million in competitive research funding, as well as receiving ongoing operational and administration funding from the government of South Australia. Home to 600 scientists, SAHMRI brings together researchers from the state's three universities and the CSIRO to investigate the key themes of: Aboriginal health; cancer; healthy mothers, babies and children; heart health; infection and immunity; mind and brain; and nutrition and metabolism.

As well as providing an iconic workplace to attract and retain the best local talent, the building aims to attract scientists and researchers from around the world, and so was built to LEED Gold Standard, using the ratings tool of the US Green Building Council to measure environmental performance in design, construction and function over time. SAHMRI is the first building of its type in Australia to achieve a LEED Gold rating.

Unlike typical research facilities that are closed to the public and their surrounding environment, the building embraces transparency and connections to the outdoors, even in the physical containment spaces, which were deliberately designed to capture views and daylight. Another major shift in the design approach aimed to encourage cross-pollination of ideas among researchers and staff by creating opportunities for them to randomly meet – at tea points, cafes, on a spiral staircase that connects the upper floors, and in the fully glazed auditorium at podium level.

Designing a building that is both of its place and a global icon was no easy task, but it was one that design team leader Woods Bagot was well placed

to deliver. The firm was founded in Adelaide in 1869 and now has 16 studios in Australia and seven other countries, including the USA, UK, UAE and China.

According to Anoop Menon at Woods Bagot, the architecture had to address multiple constraints and challenges, which dictated the building's unique shape and form. "Starting with the client's vision, the integrated design team considered the new Royal Adelaide Hospital Project going up next door, and since this area had to be read as an integrated health and medical precinct, the forecourt plaza on North Terrace became the entrance and main interface to share with the hospital," Menon says. "The open ground plane and integrated landscape on the Plaza allows for greater activation and porosity through the precinct. This unique site geometry gave us the urban framework to start with, and the fact that SAHMRI acknowledges its sense of place within the edge of the Adelaide parklands enabled the lifting of the building, which allows the parklands to extend below it.

"We wanted to give the building form a unique sculptural quality while creating an illusion of it floating above the ground plane," he continues. "Working collaboratively with the structural engineers, Aurecon, the design led to a sophisticated structural solution of transferring

"Aurecon designed a pretty brilliant structural system that has to cantilever to support the 'noses' at level five: only steel could do that efficiently"

36 columns down to six 'flower columns', thanks to their 16 metre-long diagonal steel struts.

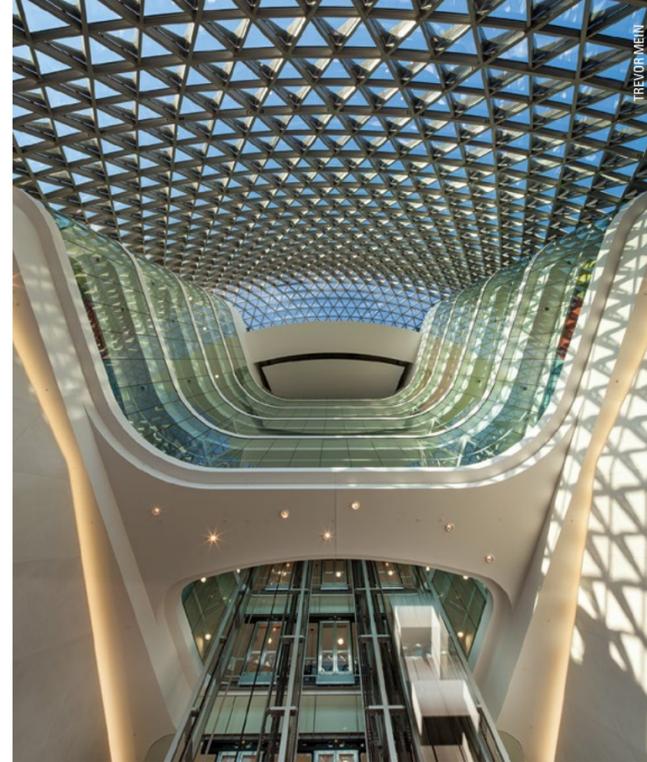
"The lifting of the building acts to liberate the ground plane to encourage public interaction, while the transparent facade showcases the two atriums inside the building," Menon explains. "The west atrium expresses the entry and bridge links between the laboratories while the east atrium expresses the active workplace environment inside. Together with the expression of the laboratory flues outside the west facade, the function of the building is clear and aims to promote the importance of the research within."

Woods Bagot facade expert Michael Andrew recalls there were a multitude of challenges and constraints to face with such an ambitious project "from connections to sequencing and everything in between. Take the steel flower columns in the base," he says. "Aurecon designed a pretty brilliant structural system that has to cantilever to support the 'noses' at level five: only steel could do that efficiently."

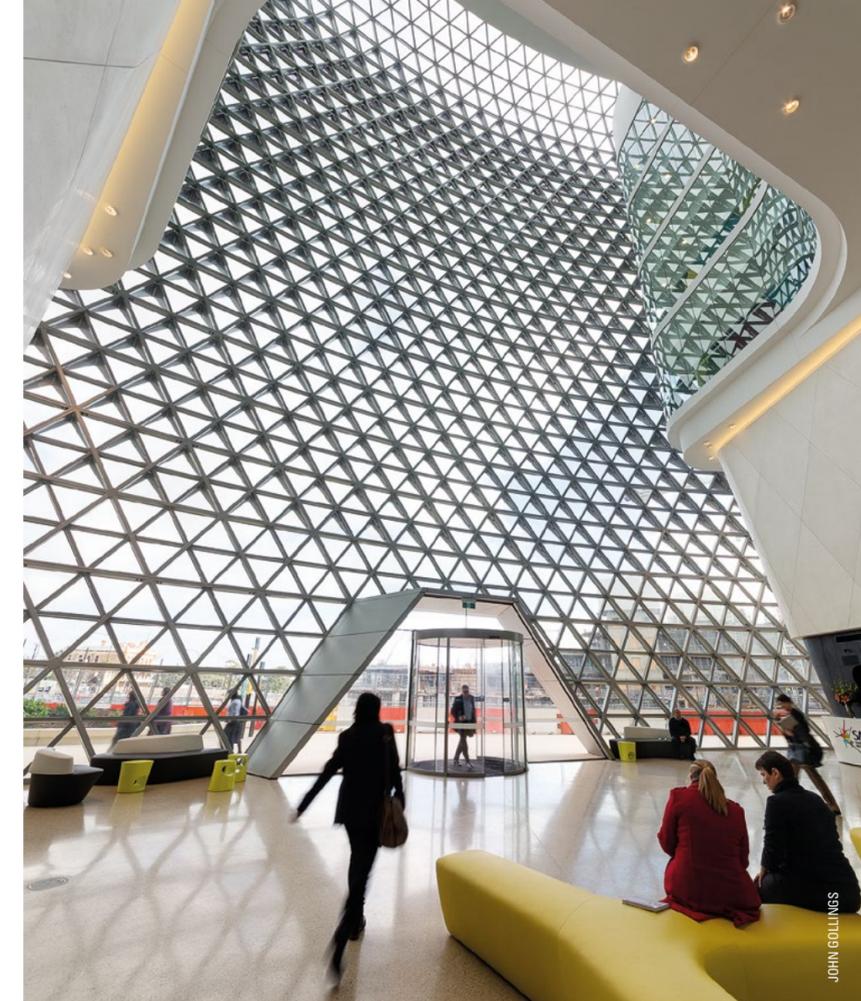
The building's skin, covering a total area of 13,000m², features a complex web of steel, aluminum sunshades, glass and woven mesh. "The skin comprises 15,000 equilateral triangles that form a unique and innovative steel diagrid facade system," explains Paul Koehne, senior structural engineer at Aurecon. "The facade includes two massive atriums, supported by a steel diagrid spanning 40 metres horizontally and standing 40 metres tall, with a maximum steel section size of just 150 millimetres deep, at a steel density of 40kg/m².

"From a square-metre perspective, the glass on the atria is actually heavier than the steel diagrid that supports it," he adds. "Creating such a slim and structurally efficient system was only possible using steel. The building is truly magnificent and must be seen in person to get an appreciation of what the design team has achieved."

Traditional curtain walling was used to create the skin for the flat sections on the east and west elevations, but where complex

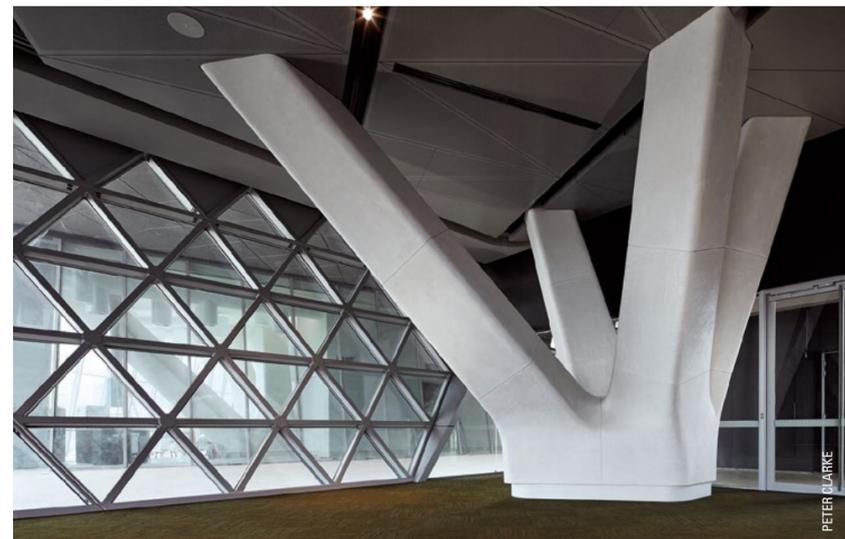
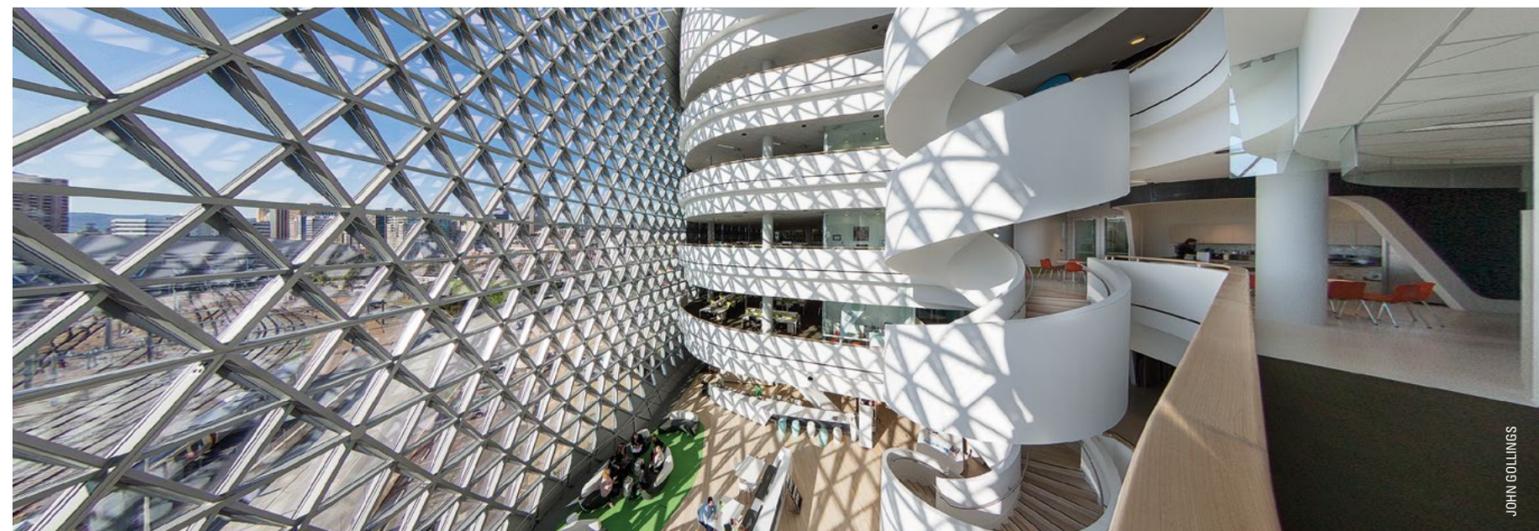


ABOVE: The west atrium contains glass lifts that enhance the feeling of transparency throughout the building



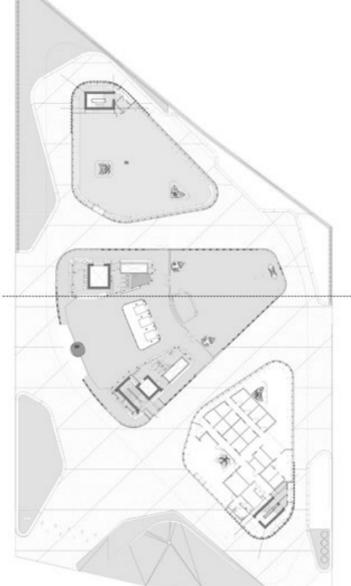
RIGHT: The building's podium-level foyer is one of its most distinctive features. It is on grade with North Terrace and open to the public

BELOW: On the building's eastern side, the spiral staircase and cafe / breakout space on level four serves both as social and collaborative space



LEFT: Six steel 'flower columns' at podium level transfer the weight of 36 columns in the upper floors to the ground, via 16 metre-long diagonal steel struts





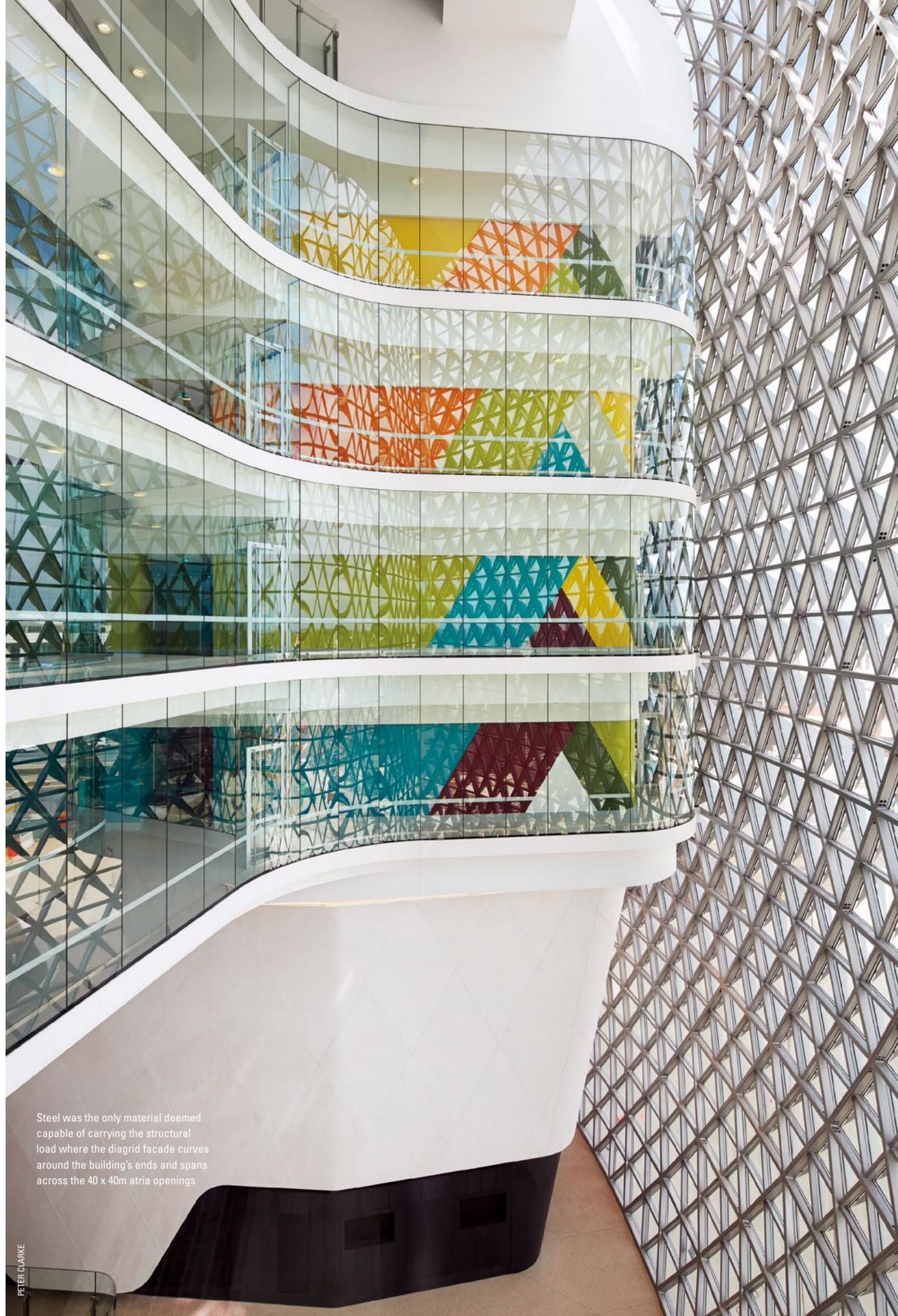
LEVEL 3



LEVEL 4



LEVEL 9



Steel was the only material deemed capable of carrying the structural load where the diagrid facade curves around the building's ends and spans across the 40 x 40m atria openings

PETER CLARKE

geometry and two-way curves were required – at the atria and the ‘noses’ – the structural steel diagrid was essential. It was constructed using RHS sections welded into 224 unique panels.

For ease of transportation, the majority of these panels, measuring up to 13m x 4.5m in size, were fabricated in halves and then welded together. After fabrication, the steel was treated with three-coat high-performance paint and then fully glazed off-site to eliminate the need for time-consuming and costly site glazing. With no lay-down area on site, facade subcontractor Yuanda, in collaboration with SA Structural, installed each panel directly onto the building in a jigsaw-like arrangement.

“I take my hat off to the engineers, steel fabricators and erectors, including John Hindmarsh, Aurecon, SA Structural and Yuanda,” Michael Andrew says. “They had some intricate issues to face and they

worked well together as a team to incorporate a safe and efficient means of installing such a complex structure.”

As well as giving the building its unique appearance – which locals have variously dubbed the ‘space ship’, ‘pineapple’, ‘cheese grater’ and ‘radiator grille’ – the facade provides shading via a series of fixed sunshades that vary in size in response to their location and orientation to provide the most efficient protection from the sun and heat, while mesh and perforated panels within the facade allow the building to take in fresh air for distribution throughout the interiors, “like an organism that breathes”, Menon says.

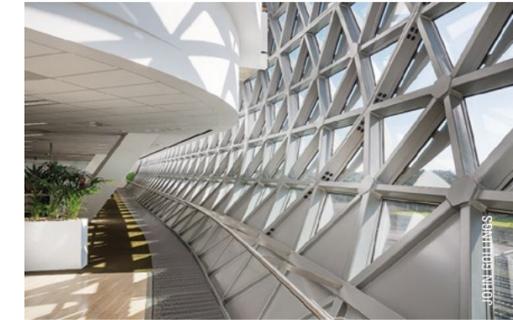
Inside, the building is divided into below- and above-ground sections by the plaza that sits slightly above North Terrace. The larger, subterranean section houses the state’s first cyclotron, vivarium, laboratory and building infrastructure, plant, and staff car parking. The main public entry is on level three, and the fourth floor – which has diagonal structural steel columns rising through it to level five – houses a dry laboratory, meeting rooms, consult rooms and the Institute’s main collaborative and social spaces, including a cafe. The five upper floors are divided into two lab modules arranged around vertical circulation options – glass-walled lifts and a spiral staircase – at the centre of each floor plate.

Within these modules, the various room types were arranged hierarchically according to their functional and daylight requirements so that common ‘write up’ zones overlook the parklands to the north-east, physical containment laboratory spaces are placed along the central spine, laboratory support spaces and equipment zones are placed along the western edge, and plant is positioned in the building’s end ‘noses’.

On the roof, the architects were careful to apply the same rigorous design thinking to provide ongoing flexibility and adaptability into the future. The toroid-shaped roof curves over the top of the building in two directions, much like the carapace of a beetle, with structural steel again chosen for the structure as the only material capable of being

The toroid-shaped roof curves over the top of the building in two directions... with structural steel again chosen for the structure as the only material capable of being twisted and bent in two directions simultaneously

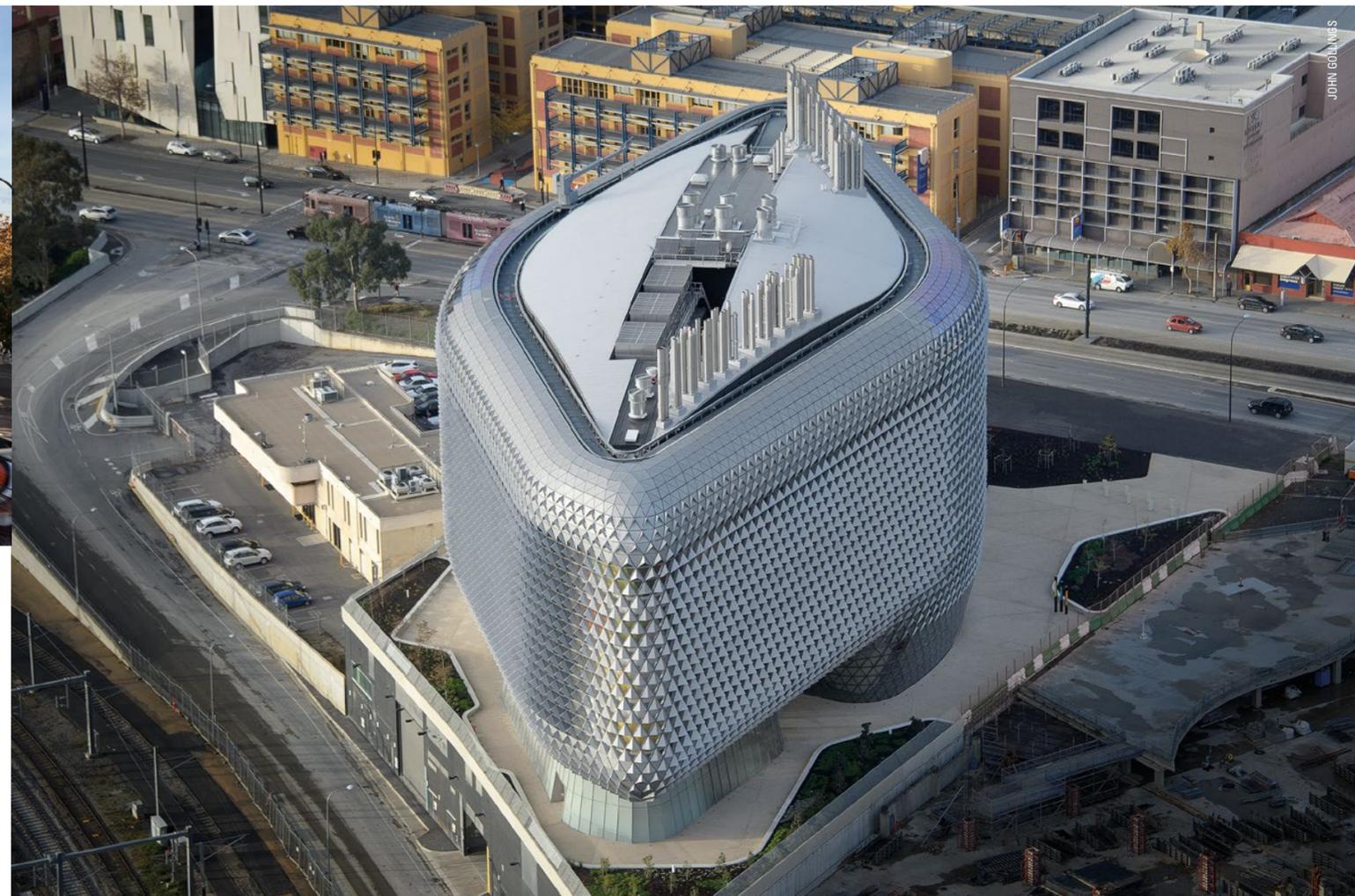




ABOVE (LEFT TO RIGHT): The spiral stair connects levels four to nine and creates opportunities for people to meet and chat informally. Inside the laboratory, write-up and circulation spaces, the building's distinctive facade delivers abundant natural light and visual connections to the landscape – qualities not often found in research facilities

RIGHT: The new building exerts a strong presence on North Terrace and has become a popular talking point in Adelaide

OPPOSITE: The beetle-shaped roof, clad in Fielders KingKlip® 700 profile made from COLORBOND® Metallic steel in the colour Citi®, was designed to be flexibly adapted when research needs change in the future



PANEL SAYS

The new health and medical research facility in Adelaide has a spectacular steel diagrid facade that speaks eloquently about the program of the building. The new-age skin changes at every angle, with every image offering a different perspective, reflecting the way that scientists and researchers working inside must consider new concepts and frontiers, and challenge their own and others' assumptions and beliefs. The building is even more striking because it is so completely unexpected – bordering on fanciful and fantastic. It is inspiring to witness projects of this calibre and innovation being built in Australia. It's a truly world-class, ground-breaking project

twisted and bent in two directions simultaneously. A test rig set up to verify the roof deck profile could spring-bend over the two radii without deformation proved very successful.

The two-tone roof cladding – Fielders KingKlip® 700 profile made from COLORBOND® Metallic steel in the colour Citi® and COLORBOND® steel in the colour Monument® – was chosen for its light weight, durability and ability to blend seamlessly with the complex facade system which wraps up onto the roof.

“We didn't want to just stick the plant rooms on the roof. This was partly because of the flight path above it, but mainly – in conjunction with services engineers Norman Disney & Young – we wanted to ensure that the services design provided maximum flexibility and future-proofing,” Menon says. “These services requirements were carefully coordinated with the services subcontractors and integrated with the structure and architecture. Consequently we spent a lot of time getting the roof right.

“The SAHMRI project has been achievable through a collaborative design process with the client group, consultants and the contractors,” Menon adds. “Without the project team's innovative solutions, the architectural vision would not be achievable.”

No matter which angle you look at it from, SAHMRI is an impressive building on multiple levels and a testament to the vision and dedication of the people who brought it to fruition. Such is the level of interest in the building that public tours – held every Friday – are booked out months in advance. “For Adelaide, it breaks the mould as a landmark in a city that is notorious for being conservative,” says Andrew. “The public love it, especially the dynamic that it brings to that part of North Terrace, down to the river bank and over to Adelaide Oval.”

As for the building's new occupants, Menon says they are adjusting well to working in an entirely new kind of research facility. “We understand that the researchers are very happy with the quality of the spaces, they are embracing the open plan and flexible collaborative spaces, and the increased daylight and enhanced external views will create healthier internal workspaces.

“During this project we really tapped into the synergies of what SAHMRI wanted: the vision they had to ‘bring a thing of the world to Adelaide’,” Menon concludes. “Bringing that to life in this building is something that we are proud to have done.” SP

PROJECT South Australian Health and Medical Research Institute (SAHMRI) **CLIENT** Government of South Australia, SAHMRI **ARCHITECT** Woods Bagot **LABORATORY SPECIALIST** Research Facilities Design **STRUCTURE, CIVIL, FACADE, TRAFFIC, GEOTECHNICAL, WIND, SPECIALIST VIBRATION, ELECTRICAL, VERTICAL TRANSPORTATION, FIRE PROTECTION** Aurecon **BUILDING SERVICES ENGINEERS** Norman, Disney & Young **COST MANAGER** Rider Levett Bucknall **ENVIRONMENTAL CONSULTANTS** Cundall & Atelier Ten **PROJECT RISK MANAGEMENT** Department for Transport, Energy and Infrastructure **MANAGING CONTRACTOR** Hindmarsh Construction **FACADE CONTRACTOR** Yuanda Australia **3D FABRICATION MODELLING** 4th Dimensional Facade Solutions **STRUCTURAL STEEL** SA Structural **LANDSCAPE CONSULTANT** Oxygen **PRINCIPAL STEEL COMPONENTS** Primary structural steel for flower columns, Level 4 floor structure and roof structural steel was constructed using Universal Beams supplied by OneSteel Australia (85 per cent of total structural steel). Roofing: Fielders KingKlip® 700 profile made from COLORBOND® Metallic steel in the colour Citi® and COLORBOND® steel in the colour Monument® **PROJECT TIMEFRAME** Five years from conception to completion **BUILDING SIZE** 25,000m² gross floor area **TOTAL PROJECT COST** \$200 million (Commonwealth funded) **AWARDS** 2014 Australian Institute of Architects National Awards: Commendation – Public Architecture; 2014 SA Australian Institute of Architects Awards: Public Architecture Award, Commercial Architecture Award, Interior Architecture Award, Sustainable Architecture Award and COLORBOND® Award for Steel Architecture; 2014 WAF Awards, Future Project, Health: shortlisted; 2014 WAN Awards, Healthcare Unbuilt – Shortlist; 2014 WAN Awards, Facade Award – Highly Commended; 2014 Design Institute of Australia – Gold, Built Environment – Winner, DIA President's Award – Winner, Laminex Award; Australian Institute of Builders – Professional excellence award, Commercial construction \$100 million-plus

FINE DINER

Tasked with transforming one of Sydney's oldest heritage police stations into a restaurant, Welsh + Major overcame the building's quirks to create a highly detailed new space crafted from plate steel.

Words **Rob Gillam** Photography **Paul Bradshaw**

Built in 1882 to Colonial architect James Barnett's design, Number Four Police Station's original sandstone entrance on George Street is highly ornate and bears authority-alluding motifs such as at the apex, where a lion's head holds a brass police baton in its mouth. Considering the requisite climb to reach this baton, it's stolen with surprising frequency. If still in force, the vicious floggings early settlers received for far milder transgressions would surely deter all but the most fortified patrons of the many surrounding public hotels.

Last used as originally intended in the 1970s, the station sat vacant from 2009 until the Sydney Harbour Foreshore Authority revitalised it for retail use.

Architects Welsh + Major seized upon a tiny slice of courtyard on Nurses Walk at the station's rear to create a new entry and dining room. A highly refined cassette-like structure was custom-made from 6mm and 8mm BlueScope XLERPLATE® steel and 'dropped in', adjoining the existing brick building on one side and slightly overhanging it on the other. This created a delightful annexe-style volume that Chris Major affectionately calls 'The Porch'.

Reconciling the new structure with the existing building was a complicated exercise and ultimately dictated material selection, as Major explains. "The thing with these old buildings is that everything's a little bit wonky. Nothing is

Director of project builder A.J. Bristow & Sons, Toby Bristow, concurs. "It's really just attention to detail and understanding the most important parts of the building. There was a lot of site measurements and double-checking. A lot of time spent with the workshop drawings to make sure of the dimensions."

"It was quite difficult to keep some of the very light members straight and maintain structural integrity," Bristow adds. "If they're three or four mill out on tolerances it can impact on the glass facing, so you can't waterproof. So if things aren't fabricated to specification, they go back."

"We required a material that dealt in fine tolerances so it was always our intention to use steel"

perfectly straight, square or parallel," she says. "Because of that, all the individual components had to interlock perfectly to meet our calculations so almost everything was custom-made. We required a material that dealt in fine tolerances so it was always our intention to use steel."

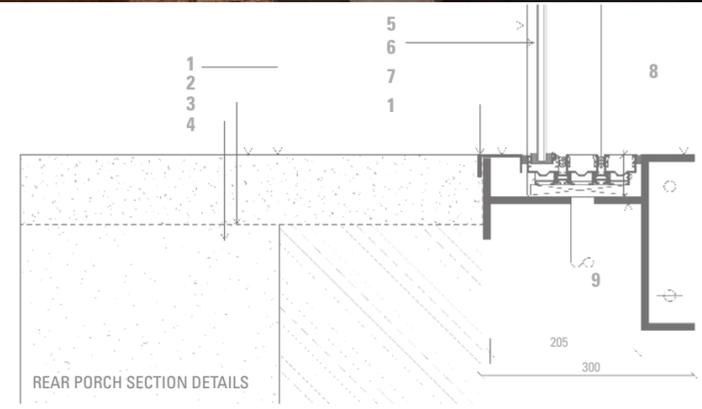
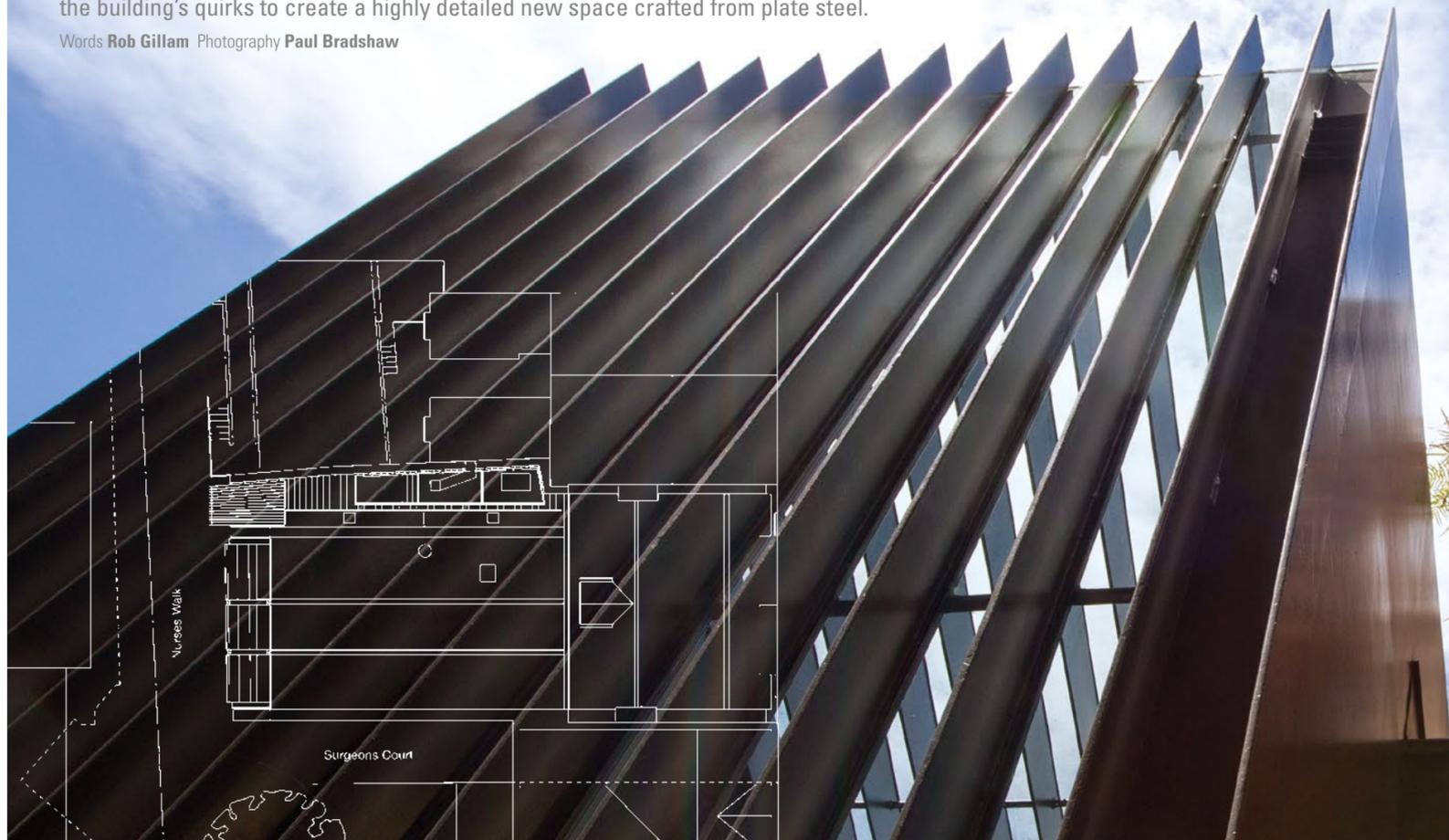
Box frames with surrounds containing double-height glass windows and finely clustered steel fins – which wrap around and slice through a glass skylight – proved particularly finicky. Major eschewed 3D modelling to tackle this intricate challenge, and opted instead for old-school methods.

"It can be done in plan, section and elevation," she explains. "You've just got to work it out properly. There was a lot of backwards and forwards with the shop-drawings and we had to adapt a few things along the way, but basically it's just good detailing."

The project's accomplishments are widely acknowledged: it won the Australian Institute of Architects New South Wales Chapter 2014 Heritage Award and a National Commendation for Heritage at the National Awards.

Having given this majestic old building a new life, does the architect have a favourite feature to reflect on? "I really love the new entry, where you can stand and sense the sky through the really slender steel fins that have finesse and transparency, but also a robustness," Major says.

"It plays with the idea of lightness and solidity," she adds. "The existing building is quite heavy and cloistered inside: the cells with their original steel bars being almost oppressive. Then you step out into a space that opens right up and has lovely light filtering into it. It's quite a special place to be." **SP**



PROJECT Former Rocks Police Station **CLIENT AND PROJECT MANAGER** Sydney Harbour Foreshore Authority **ARCHITECT** Welsh + Major **PROJECT TEAM** Chris Major, David Welsh, Gabrielle Pelletier, Andrew Short **STRUCTURAL & CIVIL ENGINEER** Shreeji Consultant **BUILDER** A.J. Bristow & Sons **STEEL FABRICATOR** Bellingham Engineering **SHOP DRAWING CONTRACTOR** Archview Design **PRINCIPAL STEEL COMPONENTS** Structure: 6mm and 10mm BlueScope XLERPLATE® steel **PROJECT TIMEFRAME** Completed 2013 **AWARDS** Australian Institute of Architects NSW Award – Heritage Award; Australian Institute of Architects National Awards – Heritage Commendation **BUILDING SIZE** 380m² (new annexe volume 52m²)



STEEL PROFILE 120



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