

130

DECEMBER 2019

ARCHITECTURAL

STEEL INNOVATION

WITH BLUESCOPE

STEEL PROFILE

NH ARCHITECTURE

THE CINEMA COMPLEX AT DISTRICT DOCKLANDS

ARCHITECTUS IN ASSOCIATION WITH HDR

WERRIBEE MERCY HOSPITAL

IN PROFILE:

FRANK STANISIC

EDITORIAL

Since 1981, *Steel Profile*® magazine has charted the rise and use of steel as a dynamic element of Australian architecture. It has showcased inspiring and innovative designs of all scales and types – from bespoke houses to city-shaping infrastructure.

Importantly, *Steel Profile*® magazine has also celebrated the architects that have helped to establish steel as an essential part of Australia's architectural vernacular.

With that in mind, it has been extremely beneficial to attend the Australian Institute of Architects National Conference as the Principal Corporate Partner and hear from architects about how steel is shaping their emerging designs, and also to attend the recent Australian Steel Institute's Convention as a Platinum Sponsor to talk with industry leaders about the future of steel in Australia.

Reading through issue 130, I'm impressed by the stunning projects, and the level of co-ordination, trust and goodwill that goes into making a good project, great. It's never been clearer that behind every great project is an even greater team of individuals, all focused on contributing and delivering on a project's shared-vision.

The projects chosen for this issue are a testament to that shared vision, sense of responsibility and reward for effort.

Copies of previous issues are now available online and can be downloaded from steelselect.com.au/steelprofile. And while you're there, have a look around SteelSelect®, a website designed to help architects and other specification professionals research, design and specify steel building products and construction solutions.

It is now easier than ever before for you to share your projects for consideration in a future issue of *Steel Profile*® magazine. We invite you to submit projects that feature ground-breaking or an innovative use of steel, by simply visiting steelselect.com.au/steelprofile/submit and completing the online submission form. We'd love to hear from you!

Brad Wickham
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:



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.



PENNY FULLER

Penny is a partner at Silvester Fuller, established in 2008. Silvester Fuller's first built projects have been awarded for their creativity and design sensibility. Penny's work draws on experience gained across a broad range of international projects. She is a previous recipient of the Australian Institute of Architects' Emerging Architect Prize.



MATTHEW HYLAND

Matthew Hyland works with Hogg and Lamb. He obtained a Master of Architecture from the University of Tasmania and was awarded the 2015 BlueScope Glenn Murcutt Student Prize.

Having a preoccupation with enriching the ordinary, Matthew is continuing to develop and refine design processes through observation, research and experimentation.

ISSUE 130 CONTENTS



This new cinema complex by NH Architecture creates an eye-catching statement with swathes of kinetic, angled cladding finished in a daring custom COLORBOND® steel colour; Monika Red™.



First inspired by an in-construction Sydney Opera House, decorated architect Frank Stanisic has gone on to create his uniquely coalesced examples of Modernism and urbanism.



Steel was the material-of-choice for this finely resolved house-for-two that gently 'glamps' in a raw WA environment, its roofing and cladding made from COLORBOND® steel blending into the native landscape.



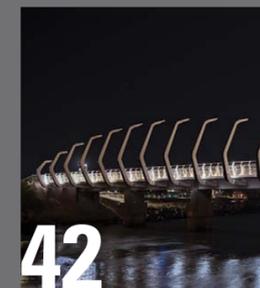
Appearing to be made from super-sized children's building blocks, the scale of this enormous cantilevering hospital extension is mitigated through a patterned walling system made from COLORBOND® steel.



Through a series of zig-zagging, origami-shaped sunhoods made from LYSAGHT CUSTOM ORB® profile in the colour Windspray®, Susan Dugdale & Associates dually provides this building with aesthetics and elemental protection.



Optus Stadium's three key architects – HASSELL, COX Architecture and HKS Architects – collaborated to fulfil the design vision for a distinctly Western Australian, world-class sports and entertainment facility – underpinned by BlueScope steel.



Re-using original steel foundations, the design for this new pedestrian bridge with its sculptural ribs made from XLERPLATE® steel and TRU-SPEC® steel draws inspiration from whale bones and shipwrecks.

Principal Corporate Partner

Australian Institute of Architects



COVER PROJECT

The Cinema Complex at District Docklands

PHOTOGRAPHER

Paul Bradshaw

NUMBER 130, DECEMBER 2019

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Far from a boring, blocky cinema building, taken to saving its action for the screen, this eye-catching project by NH Architecture makes a spritely statement with flashes of cladding made from COLORBOND® steel – most notably in ARM Rollforming's custom-made MegaRib® profile, in the custom colour Monika Red™.

Words **Peter Hyatt** Photography **Paul Bradshaw; Nick Hubicki**

PICTURE PRETTY

ARCHITECT

NH Architecture

PROJECT

The Cinema Complex at District Docklands

LOCATION

Docklands, Victoria

At its heart, architecture needs a sharp eye and a hard head. It's welcome, then, that the definitive design for this new cinema entertainment complex at District Docklands cuts like a scythe.

Working from 'warehouse' origins might appear misguided for achieving the uplifting, yet this is precisely what has occurred in this project's instance. Streamlined and striking, the cinema stands well-apart from the common typology: the rabbit warren-like Brutalist cinema megaplex.

Steel wall cladding, made from COLORBOND® steel, wraps around the building like a curtain and provides the project's vivid design motif.

Particularly striking is the western facade's triangular-shaped cladding profile, from ARM Rollforming, called MegaRib® – which acts as a rainscreen. This is custom-made from COLORBOND® steel which is folded into 210mm by 305mm angles and repeated in series. Painted in the custom colour Monika Red™, the cladding provides a daring signature that project architect, Nick Hubicki of NH Architecture, describes, "As a kind of pleated house curtain, reiterating the building's function while reconnecting it to a former cinematic experience: an anticipation of the screening and illusion."

Hubicki extols the virtues of the building envelope that dazzles not with glare but in its visual impact. Forget neon, or sugar-dusted graphics. This taut design narrative is vividly inviting and utterly fitting for a house of fantasy.

The customised triangular cladding made from COLORBOND® steel in the custom colour, Monika Red™, is complemented by a more traditional cladding in the same colour: LYSAGHT LONGLINE 305® profile. Other contrasting colours for the wall cladding include the same LYSAGHT LONGLINE 305® profile in the COLORBOND® steel colours Thredbo White® and Monument®.

Interestingly, one of the project's biggest sticking points was colour. Hubicki tells how the client had to be persuaded by the team's proposal. Convincing the client to remain open to change demanded imagination and effort. His experience is a reminder

that design of consequence invariably owes much less to the 'brilliant flash' than perseverance.

"Colour might not normally be such a preoccupation, but in this context and setting it was pivotal," says Hubicki of the custom colour Monika Red™.

Colour can divide client and architect as easily as unify. "It's a vibrant red," he says. "You see it from the freeway and travelling along Footscray Road. It provides this tremendous visibility and feels incredibly 'right' given its function and role.

"As soon as we saw the prototype in the factory we said: 'This is it!'. And that was what ultimately won over the client. Until then, he was unconvinced about the red, but when he saw the prototype he had no doubts. He loved it! That was the game-changer."

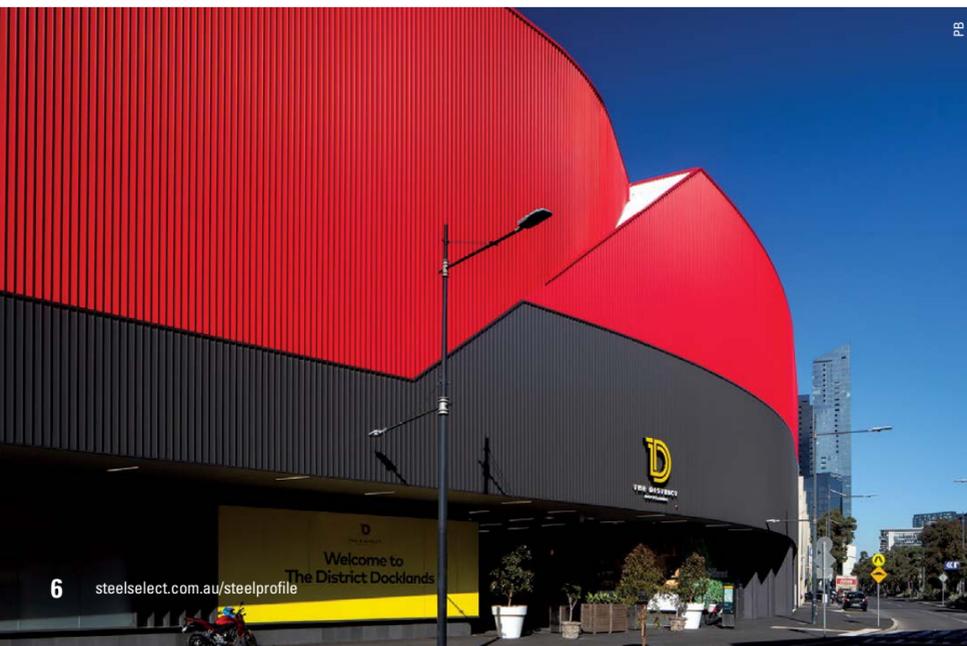
Almost thwarted from the outset, the site is less one of pristine possibilities than cautionary tale. The architect describes the site as one created from the space left over between the Melbourne Star Observation Wheel and Costco warehouse. "It was extraordinarily difficult," he says.

"There were so many competing forces. It's a reminder that architecture is the act of dogged problem-solving and lateral creativity."

NH Architecture helped heal Docklands' reputation for mediocre buildings with its 2009 design for Costco, resulting in a steel beacon that suddenly activated the site's northern edge. With rare kinetic energy, it turbo-charged a resurgence in better-scaled, bespoke structures.

Costco provided Hubicki with déjà vu, when embarking on the cinema complex. "Its language and dynamism provided a momentum for what was possible, second time around. "There is a symbiosis," he enthuses, "between the earlier building made from COLORBOND® steel in the colours Shale Grey™, Monument® and the custom colour O'Hara Red, and its recently delivered sibling.

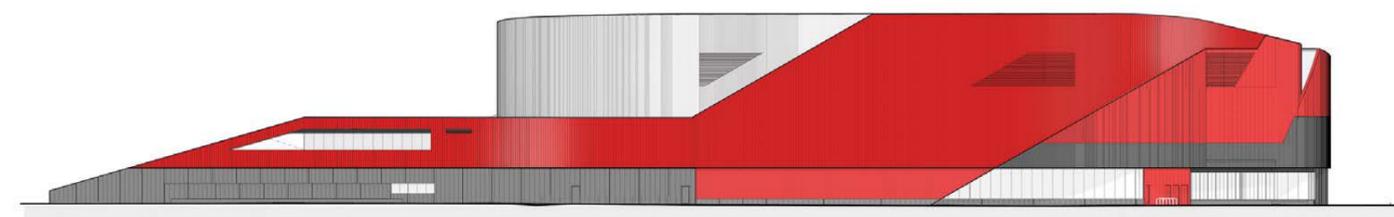
"We wanted elements of that first colour scheme – primarily charcoal with a red slash – so that the two buildings could 'ricochet' off each other. It's not often you get to do buildings so many years apart on different sites with different clients that can have such a dialogue." 🗨️



"It's a vibrant red. You see it from the freeway and travelling along Footscray Road. It provides this tremendous visibility and feels incredibly 'right' given its function and role."

ABOVE: Clarity and stand-out projection are hallmarks of this visitor-magnetic project.

LEFT: The customised triangular cladding made from COLORBOND® steel in the custom colour, Monika Red™, is complemented by contrasting cladding made from COLORBOND® steel in the more traditional LYSAGHT LONGLINE 305® profile, in the colour Monument®. The profiles and colours provide an elegant, articulated facade recalling an industrial port history.



NORTH ELEVATION

Wrapped around a tight site at the base of the Melbourne Star Observation Wheel, the complex generates a strong standalone presence yet dovetails into the precinct's recent typology.



Hubicki says the project's daring is exemplified by the intensive steel customisation and testing. "The building is a minor essay in how large-scale customisation can be efficiently achieved through collaboration not merely of architect and client, but builder and manufacturer."

He says that the trailblazing qualities of the envelope demanded intensive problem-solving. "The whole production team was exceptional". He reels off some of the key suppliers and consultants: "Rollformer, fabricator, builder and BlueScope who helped us connect with pivotal people able to contribute to this result."

Hubicki says the stellar cast of BlueScope products was pivotal to the project's success. This included over 200 tonnes of cladding and roofing made from COLORBOND® steel in LYSAGHT LONGLINE 305® profile; 25 tonnes of custom-made triangular cladding made from COLORBOND® steel, welded beams and columns made from XLERPLATE® steel, as well as purlins and girts made from GALVSPAN® steel.

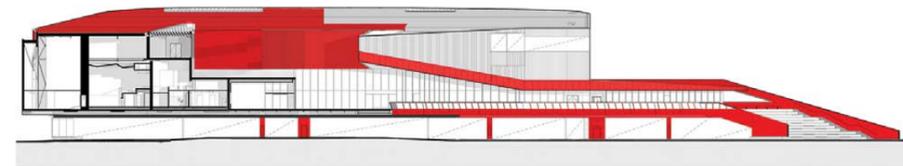
Roofing is made from COLORBOND® steel in LYSAGHT LONGLINE 305® profile, in the colours Monument® and Surfmist®, and the project's signature custom colour, Monika Red™. "The roof is mainly darkly coloured and also has the lighter-coloured Surfmist®," he says. "The red gives it zing and isolates it from everything else, very quickly. Our office puts a high premium on roofs. They're never considered wasted, or invisible.

"The project forms a contextual dialogue between existing structures," he continues. "The malleable and dynamic properties of the LYSAGHT LONGLINE 305® profile and the triangular sections made from COLORBOND® steel were exploited to allow the building to maximise its volume, given an unusually difficult site boundary.

"This had to be made from scratch and the full building height had to be achieved seamlessly. Mike Brinkman, BlueScope's specification account manager, put us in touch with ARM Rollforming's Henry Wolfkamp."

"Mike did us a great favour by introducing Henry because he is remarkable. Henry worked with BlueScope and ourselves to prototype just the right profiles and paint colours."

"The malleable and dynamic properties of the LYSAGHT LONGLINE 305® profile and the triangular sections made from COLORBOND® steel were exploited to allow the building to maximise its volume, given an unusually difficult site boundary."



SECTION



SECTION



Another contrast for cladding made from COLORBOND® steel in the custom colour, Monika Red™ is the colour Thredbo White®.



Wolfkamp also responded to the architect's request for the biggest, longest sheets available. "Henry was fantastic," says Hubicki. "Nothing was too much trouble. He created the sample 220mm profile as well as the super 18-metre length, rather than the standard 6-metre variety."

Wolfkamp describes the whole process between the installers, architects and builders as one of "huge goodwill".

"We produced the sample profile, had our best operator on the roll-forming job and a team of people to stack and handle the sheets with

the care to ensure it all arrived on site in pristine condition," Wolfkamp says.

"We were interested in using a material we could 'push'," Hubicki remarks of the great spans achieved from a profile that is only 1.2 millimetres thick. "Without end-lap connections at 1200mm centres vertically, it is just one length of steel at 18 metres."

Now the project is complete, is Hubicki still impressed by his facade of many colours? "We recently took the Australian Institute of Architects team along as part of judging for the Victorian COLORBOND® steel Award for Steel

Architecture – which it subsequently won – and the gods were favourable to us. The light was fantastic. The rotated elevation and varied roof gradient revealed a full gamut – from a colour bordering on orange to a deep, deep red and – further along – a fiery red. It was really quite magical."

So successful has the design and development process for this project been that NH Architecture plans to continue the steel envelope momentum at Melbourne Park's new media centre. "It was simply a small idea that steel then became the dominant material on. We've learned so much from the entertainment complex that we're speaking to Henry again and so we're looking at a similar cladding.

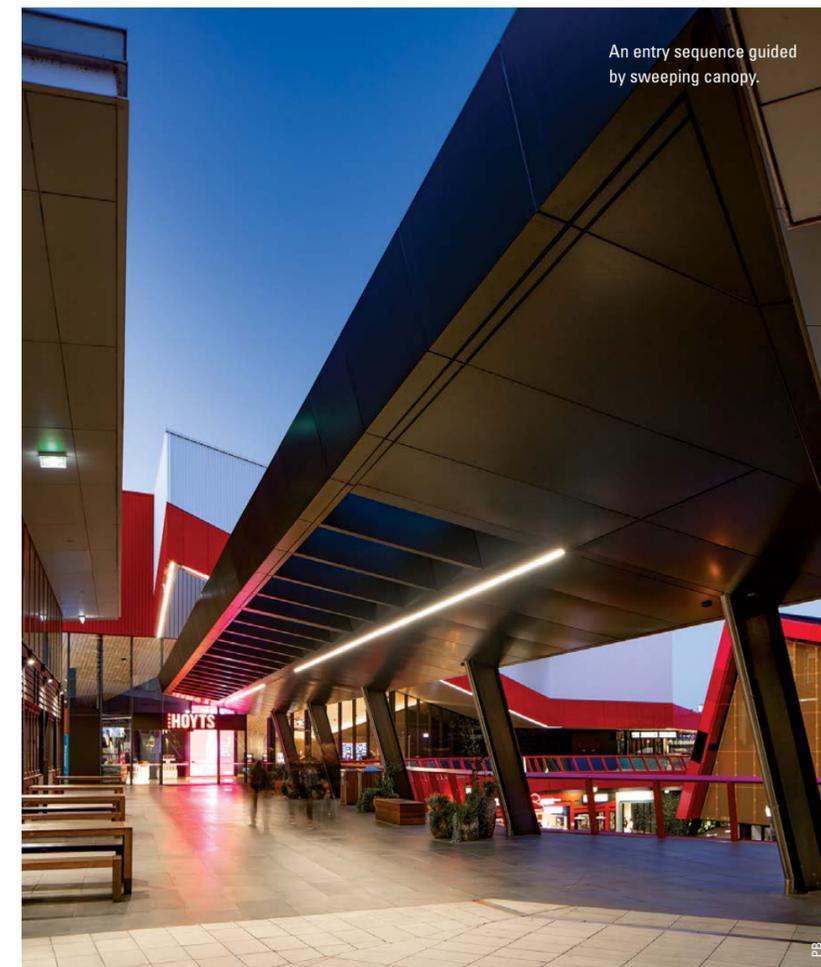
"In that project's case, we started with a simple drawing with some nominal dimensions, and we asked how we could 'push' the material to provide something jointless and incredibly cost effective."

A tough site and roadway elevation for The Cinema Complex at District Docklands might have caused Hubicki palpitations but his response to the challenge is the opposite: "Oh no, not at all. I was licking my lips (for the western facade). That is probably my favourite part of the building," Hubicki says.

"It's not very often as architects you get a big, blind wall to design and one really without apertures. It could easily be anonymous and fade away, or it can star. I think that edge of the project definitely stars."

NH Architecture continues the revival of District Docklands. Far better public engagement through design bravura suggests redemption is at hand. SP

"We were interested in using a material we could 'push'. Without end-lap connections at 1200mm centres vertically, it is just one length of steel at 18 metres."



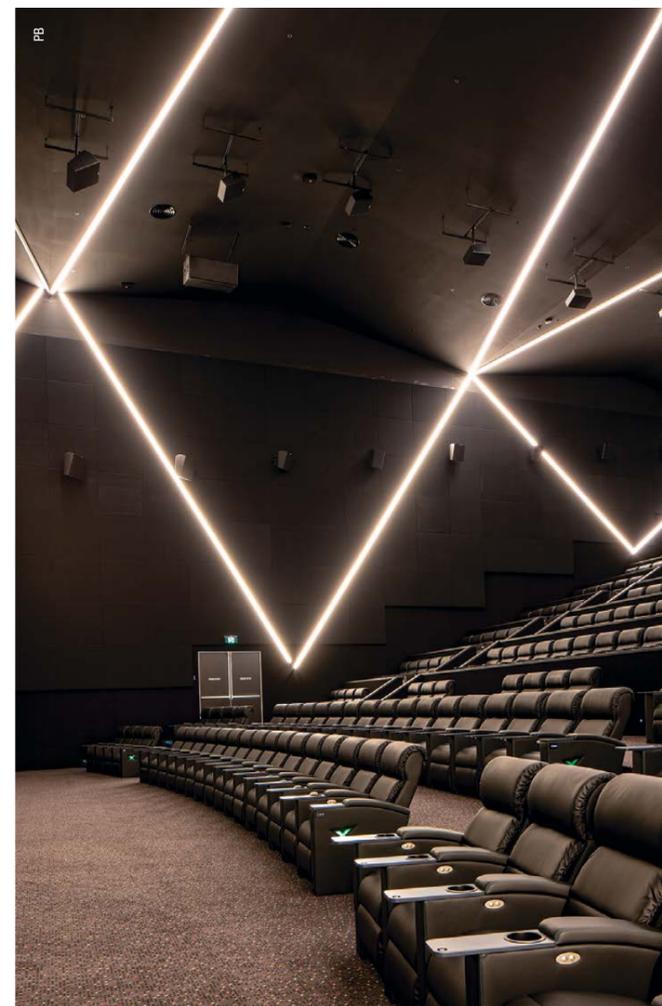
An entry sequence guided by sweeping canopy.



TOP: A promenade quality is available along the upper concourse.

ABOVE: Docklands' earlier design lethargy is boosted by the project's re-imagined warehouse typology.

RIGHT: A muted interior with highlighted graphics awaits patrons in this state-of-the-art complex.



PANEL SAYS

This new entertainment complex is a triumphant demonstration of architecture's power to overcome multiple constraints. Wedged into a prawn-shaped site between two iconic and spatially dominating projects – Costco and The Melbourne Star Wheel – it cleverly uses colour and texture to visually converse with its structural peers, and also create a bold and independent identity. The primary device for this distinct urban element – somewhat reminiscent of Gunnar Birkerts' ribbed and muscular 1978 Calvary Baptist Church – is an inventive folded triangular rainscreen, custom-made from COLORBOND® steel by ARM Rollforming in the profile MegaRib®. The profile's already pronounced legibility, which references theatre curtains, is amplified by the daring, beacon-like custom COLORBOND® steel colour, Monika Red™. The facade's playful scenography also de-scales its necessary volume, transcending a shed-like appearance.

PROJECT The Cinema Complex at District Docklands **CLIENT** Ashe Morgan **ARCHITECT** NH Architecture **PROJECT ARCHITECT** Nick Hubicki **PRINCIPAL STEEL COMPONENTS** Two-hundred tonnes of cladding and roofing made from COLORBOND® steel in LYSAGHT LONGLINE 305® profile; in the colours Thredbo White®, Monument® and Surfmist®, and the custom colour, Monika Red™. Twenty-five tonnes of triangular cladding custom-made from COLORBOND® steel in 210mm by 305mm angles, in ARM Rollforming MegaRib® profile, in the custom colour, Monika Red™. Welded beams and columns made from XLERPLATE® steel. Purlins and girts made from GALVASPAN® steel **BUILDER** Hutchinson Builders **STEEL FABRICATOR AND ROLLFORMER** ARM Rollforming **CLADDING CONTRACTOR** Close Commercial **STRUCTURAL & CIVIL ENGINEER** 4D Workshop **AWARDS** 2019 Australian Institute of Architects Victorian Chapter Awards – COLORBOND® Award for Steel Architecture; Award for Urban Design. 2018 Melbourne Design Awards – Gold Winner **TOTAL PROJECT COST** \$40 million **PROJECT TIMEFRAME** Completed December 2018

A chance visit to the Sydney Opera House helped to determine (then) high-school student Frank Stanistic's career path. Fast-forward nearly five decades, and the results of his big-picture thinking can be seen across Sydney.

Words **Rachael Bernstone**

Photography **Paul Bradshaw (portrait); Stanistic Architects**

FRANK STANISTIC

Frank Stanistic's journey to architecture was serendipitous and he can thank an unlikely teacher for helping to lay the groundwork. "As a high-school student I became interested in architecture because my economics teacher had a love of opera," he explains. "This was in 1970, and he took us to the new Sydney Opera House, which was a construction site.

"We went to see the concert hall, and the steel was being put in on the western edge – it forms all the glazing edges on the northern sides. I was knocked out by the experience," he says. "I visited it twice more before it was completed, and was always taken by the space and the spectacle of the building being constructed. Because I had always had an interest in making things, that was a pivotal experience for me."

Stanistic then studied architecture at Sydney University in the "hippy days" with contemporaries including Alec Tzannes, Wendy Lewin and Peter Tonkin; and "a lot of people who have gone on to impressive things," he says.

He has stayed the course, though; launching his own practice in 1990 and playing a significant role in shaping Sydney as it transitioned from Australia's largest city into a metropolis of global scale.

After completing university, Stanistic travelled to Europe to explore architecture projects and returned to Australia via the overland route. "We worked our way back through the Middle East and Asia, through Pakistan, Afghanistan and Iraq, at a time when nobody had any problems travelling through those places," he says.

"I saw a lot of architecture as a consequence. They were still working on Le Corbusier's capital of India – Chandigarh – and we stayed there for three or four days, sleeping in a squat and photographing the concrete.

"My interest in that project stemmed out of my interest in the Opera House," Stanistic adds. "I was always interested in Modernism with a tendency to Post-Modernism."

Upon his return, Stanistic worked first for John Andrews International, "at a time when Andrews was at his peak," he says. "I moved to Washington to work on a competition entry for Intelsat and stayed for two years; I also worked on the Cameron Offices in Canberra, and the King George Tower in Sydney," he recalls.

"Andrews was a great influence. He always asked the question: 'What is the 'big idea'?', and without a doubt we have carried that question forward, in our work.

Stanistic moved on to work for both Lawrence Nield and Ken Woolley as part of a 10-year plan. "From Lawrence, I learned about urbanism and from Ken, about aesthetics and detailing," he says. "Then I started my own practice in 1990 – almost 30 years ago – after I had paid my dues."

The coalescence of these three influences – Modernism, urbanism, and aesthetics and fine detailing – can be seen in Stanistic's output over three decades. ↗



STANISTIC ARCHITECTS

Stanistic's Imperial project, a hybrid building in Hurstville, won an Australian Institute of Architects New South Wales Chapter Award for Residential Architecture – Multiple Housing, in 2019.

"We went to see the [Opera House] concert hall, and the steel was being put in on the western edge – it forms all the glazing edges on the northern sides. I was knocked out by the experience."

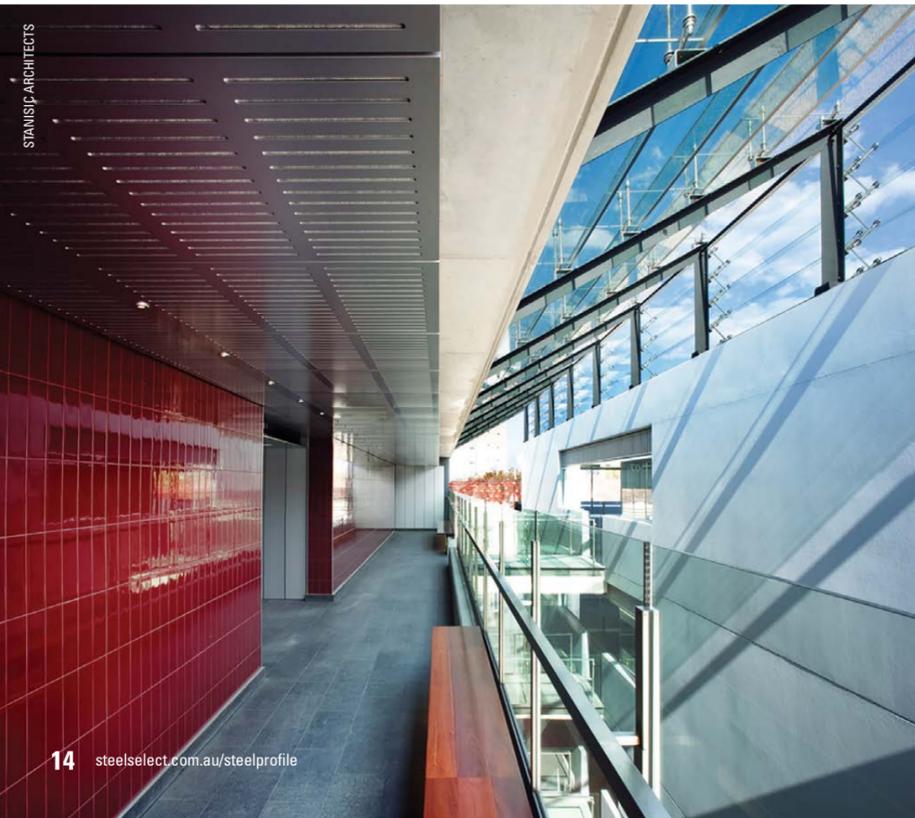


ABOVE: The Jewel project comprises three residential buildings atop a retail podium, intersected by a through-site public walkway that connects Wentworth Point to the Homebush Bay Ferry Wharf and Parramatta River waterfront.

BELOW: ERA is a loose-fit, sustainable working and shopping environment in a breathing environment rather than sealed container.

“We often find that the use of steel is an integral element of the building, which illustrates the compatibility between the use of steel and architecture. It all comes down to the skills of the architect.”

STANISIC ARCHITECTS



“I developed an appetite for urban-scale buildings at a time when architecture was all about the Wilkinson and Robin Boyd Awards, and the Great Australian Dream,” he asserts. “I was more interested in urban-scale buildings that were elements of the city; my ideas developed from architecture I’d seen in Germany and the Netherlands.”

In fact, Stanisic was in West Berlin in November 1989 – exploring the Internationale Bauausstellung Berlin, a 20-year-long urban renewal project – when the Berlin Wall came down. He remembers feeling “absolutely enthralled” by the city.

“I got my taste for housing in Berlin where they viewed it very much as an important form of architecture,” he says. “It was all delivered through competitions to a very high standard, and it was dotted through parts of the city, not out in the suburbs, because Berlin never went through that Americanisation of the suburbs.

“I also admired the pre-war tradition whereby cultural facilities – such as the Jewish Museum and the Altes Museum – sat alongside other uses, and that’s been my enduring interest,” he adds. “I don’t think I’ve ever designed a ‘house’.”

In another turn of events, Stanisic Architects partnered with Turner and Hassell in 1995 to design the Green Square Draft Structure Masterplan for a South Sydney Council design competition. It was serendipitous because even though their scheme to accommodate 25,000 new residents and 15,000 new workers was runner up to the winner, it was

subsequently adopted to guide redevelopment of Australia’s largest-ever urban renewal precinct.

“We were there when that all started, and now we have designed and completed over 20 buildings throughout Green Square,” Stanisic says. “Everyone expected that it would peter out by the time of the Olympics because Sydney was something of a ‘backwater’ then, but there was a tailwind that drove the housing market, and we were part of that.”

Incorporating ideas he’d observed in Berlin, Stanisic promoted the development of mixed-use projects that combined living, shopping, working, education and childcare uses. “It’s what I call a hybrid that expands the whole brief of housing,” he says. “Because these buildings are located in the city – where sites are rare – it’s very important to combine these uses.”

His firm cemented its reputation thanks to Sydney projects such as Mondrian in Alexandria, which set new sustainability benchmarks in New South Wales and became the first multi-residential winner of the Wilkinson Award; and Edo in East Sydney (featured in *Steel Profile*® 102) which received the inaugural Aaron Bolot Award and the national Romberg Award for multiple housing.

This year, his firm collected more awards for Imperial, a hybrid project in Hurstville – including an Australian Institute of Architects New South Wales Chapter Award for Residential Architecture – Multiple Housing.

The firm’s ongoing success is remarkable given that architects work in what Stanisic calls “occupied

territory; occupied by developers, estate agents, authorities and courts”, and even more so given the current state of the multi-residential market in New South Wales and Victoria, where construction defects and non-compliant materials are eroding public confidence in the sector.

Always concerned about the ‘big idea’ as Andrews called it, Stanisic says changes in Sydney over the past decade don’t apply only to housing. “This movement to high-density living is an historical shift with enormous implications,” he says. “We need to reduce our carbon footprint and that means we need to know what to keep and what to throw away. Most people want to throw away too much; there are buildings that are old that are good enough to keep and can be re-used.

“That’s why we like this movement towards hybridisation,” he adds. “Uses are no longer silos, they are connected and there is a fusion of programs and built forms.”

With Green Square largely built-out, the firm’s attention has turned westwards: to Parramatta where it is working on a 48-storey hybrid building in the CBD; and to Olympic Park, where a series of up to eight-storey buildings are sprouting from a former TNT site.

Other projects are underway on Sydney’s North Shore, too, including Corona in Roseville which will feature BlueScope’s most-recent iteration of COLORBOND® steel, with cladding made from COLORBOND® steel Matt in the colour Monument®.

“One of the great attributes of steel is that you can roll it to get a thin panel and then it’s lighter. And if you apply a durable finish such as is the case with COLORBOND® steel, it can last for a very long time. An added benefit of COLORBOND® steel is that it may be used wherever a non-combustible material is required by the NCC (National Construction Code of Australia),” Stanisic says.

“At Roseville, there are trees on the site that are habitat for an owl, so we’ve turned that into a positive attribute and created a courtyard with Sydney Blue Gums,” he explains. “The bridge structure, balustrades and permanent slab edge forms are steel with polyurethane finish, and the COLORBOND® steel Matt in the colour Monument® will look great there, because it’s got a lovely lustre when the sun hits it.”

As *Steel Profile*’s longest-serving Editorial Advisory Panel (EAP) panellist – a role he’s held for a decade – Stanisic has played an important role in helping choose which projects feature in this magazine. “It’s great to see the work in both urban and rural situations,” he says. “We often receive many, many submissions, and can select only a handful, so we have difficult decisions but have to choose only the very best.

Looking back over the ten years he has been on the Editorial Advisory Panel, has Stanisic observed shifts in the types of projects that are submitted for inclusion in this magazine?

“It is clear that projects using structural steel and steel cladding and roofing have become more diverse in appearance, form and use,” he says.

“In this post-Murcutt era, steel is associated with all types of projects, not just vernacular houses and sheds. Project submissions to our EAP show that steel is now commonplace in the architecture of institutions, civic centres, schools, arenas, and even affordable housing.

“Steel has moved from the bush to the suburbs and the city. My ongoing interest in the Editorial Advisory Panel is sustained by the intrinsic role of steel in shaping innovative architectural form and inspired architectural expression, from Sydney to Alice Springs, Perth to Melbourne, all showcased in *Steel Profile*.”

He also believes the quality of work has improved over his time on the panel. “The quality of design is improving as architects become more finely tuned to environmental performance and technology. Projects are increasingly shaped by site-specificity: the beauty of a natural landscape, the untidiness of the suburbs or the urbanity of the city.

He has noticed improvements in material performance, too. “Recent times have seen a greater emphasis on durability and maintenance of materials in making more sustainable architecture,” Stanisic says.

“Building defects in urban housing, due mainly to poor oversight of construction, regulations and material-selection, is emerging as a considerable challenge for architects. But, importantly, it is also an opportunity for better material use.”

Sustainability has been central to Stanisic’s practice and he has noticed and welcomed its wider adoption in the industry. “Architects have embraced sustainability and enthusiastically turned their talents to designing for apartment living,” he says.

“Sustainability has been integrated with the design approach for buildings and is not just a plug-on, but an essential design principle – although more can be done to reduce the life-cycle costs of buildings.”

For Stanisic, steel played an important part in his decision to become an architect, and it’s still an intrinsic part of his working life today. “My initial introduction to steel was at the Opera House, and we’re still using steel in our projects, today. It’s very durable, so we try and use it when we can.

“We often find that the use of steel is an integral element of the building, which illustrates the compatibility between the use of steel and architecture. It all comes down to the skills of the architect,” he says. **SP**



MEET SOBI SLINGSBY

This year we welcome a new architect to our Editorial Advisory Panel: Sobi Slingsby, a recent graduate of Griffith University in Brisbane, who won the 2019 BlueScope Glenn Murcutt Student Prize.

Sobi’s winning project expanded upon her interest in living and working outdoors. Born in Sydney but raised in Glenreagh, New South Wales, she lived between the banks of the Orara River and Emerald Beach, and spent every possible afternoon outside.

“I hung out with a gang of kids, we built rope swings and ran around in the bush” Sobi says. “I was obsessed with camping, and tried to make my sister play ‘architecture’, even if she didn’t enjoy it as much as me.”

Her Master’s thesis addressed the threat of climate change via a light footprint settlement for the remote Lady Elliot Island in the Great Barrier Reef. “My research looked at three ways of coping with climate change on Lady Elliot Island: considering retreat, consolidating or adaption,” she explains. “I opted to further investigate the ‘adapt’ scenario in my final work.

“Final year projects are usually big projects, so to put forward a tiny little borderline tent was a bit risky,” she says. “But it’s not meant to be a solution; it was designed to start a conversation, and it has, so that’s great.”

After graduating, Sobi returned to Sydney to work at Peter Stutchbury Architecture, where she is integrating her principles with live projects.

For the EDO project in East Sydney – an acronym for Environment, Diversity and Operability – Stanisic received the inaugural Aaron Bolot Award and the national Romberg Award for multiple housing in 2008.



INTO THE WILD



Situated half-way between Margaret River town and the surf that made the region famous, this COLORBOND® steel-clad house on stilts embodies all the best attributes of camping.

Words **Rachael Bernstone**. Photography **Douglas Mark Black**

ARCHITECT
Archterra Architects
PROJECT
Wilderness House
LOCATION
Margaret River, Western Australia

This house – inspired by the colours and climate of its surroundings and enveloped in COLORBOND® steel in the colours Monument® and Shale Grey™ – is built on an eight-hectare site retained by the owner for more than a decade before engaging local architect Paul O'Reilly, of Archterra Architects, to design it.

The property was originally cleared and used for farmland before being subdivided for housing blocks. "Slowly, things have returned to nature and now we have lovely wildflowers and bush," say the owners, Yvette and Ian. "Rather than being cleared and eaten by farm animals, now we have lots of marri trees.

"We'd been living overseas, and the existing cottage was rented out and it was in a state of disrepair when we came back, and we considered selling it at that point," Yvette adds. "But we opted to retain it and just enjoy the space, the trees and the birds. Then, as our life went on, our priorities changed.

"We were at an age where we were thinking about retiring, and that's when I found Paul's architecture on the internet," she says.

Paul lives about 20 kilometres away in a house that he designed, and he has built several others for clients throughout the region. His designs vary in their use of materials – he's worked with rammed earth and lightweight steel cladding – but they all share a desire to do more with less, work in harmony with the seasons, and connect their owners to the immediate surroundings.

For this project, Paul took design cues from the site itself and Ian's suggestion to lift the house off the ground, to capture distant views inland, towards the east.

"Ian had gone out there with a ladder and discovered that by elevating the new house, it would be level with – or above – the tree line to capture distant views," he continues. "He'd drawn-up a plan – a simple rectangular form that was very open. It reflected the fact they are both keen campers; they go up north to explore our national parks and remote camping spots quite often."

"I always wanted it to be built using steel to minimise the visual impact of the support structure. I was pretty happy that we had made the structure as lean as possible"

Because the block is so private – a neighbor is currently building a new home to the north, but it's not visible from this house – the site lent itself to an open design, Paul says.

Early on, they considered building the house with a timber floor, but opted instead for a suspended concrete slab to provide thermal mass and capitalise on solar passive design principles. "The slab is a dark charcoal colour, so that on warm days in winter – when the sun is out – it warms up very well and then releases that heat at night, as the temperature starts to drop outside," Paul says.

"I love the slenderness of steel," Paul adds. "If we had opted for timber floors, and used timber framing, we would have ended up with a 'forest' of timber posts and cross-bracing underneath, so I always wanted it to be built using steel to minimise the visual impact of the support structure. I was pretty happy that we had made the structure as lean as possible," Paul asserts.

The house is accessed via a long ramp made from hot-dipped galvanised Webforge grated steel, with a balustrade made of equal angle (EA) brackets and mesh; together these materials reference both

oil rigs and national park viewing platforms, where steel walkways to spectacular viewpoints are common.

"We looked first at weathering steel for the entry but came back to galvanised, and that's a theme that runs through the whole house," Paul says.

The house is also wrapped in steel, with roofing made from COLORBOND® steel in LYSAGHT TRIMDEK® profile, in the colour Shale Grey™. Wall cladding is made from COLORBOND® steel in LYSAGHT SPANDEK® profile, in the colour Monument®.

These COLORBOND® steel colours were deliberately chosen to work in accordance with the seasons and climatic conditions, Paul says. "From an energy-efficiency point of view, this is a heating climate – more so than Perth – so we opted for darker coloured cladding to help with that, in terms of sucking heat into the building in winter, whereas in Perth, you'd be trying to reflect it more in summer," he says.

"The roof colour is Shale Grey™, for solar reflectivity on sunny days, whereas the walls and flashings are in the colour Monument®, which visually recedes into the surrounding vegetation," he adds.

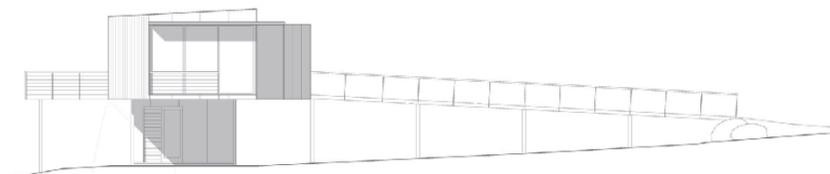
For the spatial plan and cladding, Paul repeated a detailing technique from his own house, whereby a 3.6-metre structural grid creates panelised sections similar to the experimental Case Study Houses designed by a selection of USA architects under commission for *Arts & Architecture* magazine.

It made the construction process more efficient he says. "It all went together really smoothly," Paul explains. "The steel fabricator did a great job, especially with the galvanising process, because it can warp some sections, but they tweaked these when necessary, so they went in nice and straight. They all look great, now." ➔

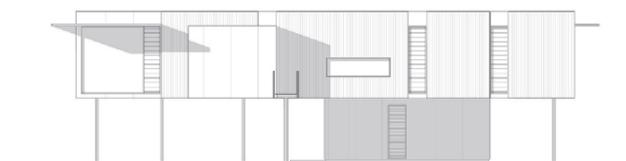


OPPOSITE: The walls, cladding and flashings are in the colour Monument®, which visually recedes into the surrounding vegetation, while the roof colour is Shale Grey™, for solar reflectivity in summertime.

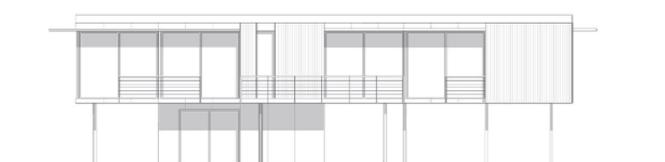
ABOVE: The narrow plan is based on a 3.6-metre structural grid of panelised sections – similar to the experimental Case Study Houses – to improve construction efficiency and enhance thermal performance.



WEST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION

PANEL SAYS

Wilderness House inhabits a very harsh environment and calls for cost-effective, robust and technically competent materials. The house's wall cladding and roofing made from COLORBOND® steel in LYSAGHT SPANDEK® profile, in the colours Monument® and Shale Grey™, define the finely resolved upper living component. The house hovers amongst the tree-tops on slender steel columns that imbue a sense of lightness and maintain a lookout across the native landscape which is connected via judicious glazing. Contrasting its raw and pragmatic exterior is an interior defined by softer materials which provide a warm and inviting glow. Its long steel entry bridge variably accentuates the landscape conditions on approach, enticing further exploration within.



In summer, the house can be opened up to encourage natural crossflow ventilation, and Paul says he had to convince Ian and Yvette to include provision for future ceiling fans, for additional air movement on warmer days if they needed it.

"We used a lot of glass which doubles as operable walls, and because it's up and out of the trees, it's easy to capture the breeze; you can open the opposing doors to flush-out warm air," Paul explains.

"Because Ian and Yvette had lived for eight years in Karratha, and they are such avid campers, they are used to taking the weather as it comes."

Like a two-person tent, the house was designed for the couple as its only occupants, so the plan is very open internally with the bed, bath and even toilet looking out to bushland views.

"They use the old cottage as a guest suite, so friends and family tend to stay in that, which means we only needed a single bedroom upstairs,"

comes back to that camping mentality," Paul adds. "Basically, it's glamping!"

"We go on safari in Africa and we go camping a lot, and because this is such a beautiful area, we wanted to enjoy the experience of being outside," Yvette says. "So now we have big, open windows and we can pretend we are in a tent, and open everything up when the weather is fine. We can see the birds at eye-level, and we can look down and see the kangaroos, although they can't see us."

These qualities provide a special and distinct advantage in a region where most homes are built using local timber; this one is definitely an anomaly, Paul admits.

"Pretty much all the houses are timber-framed and slab-on-ground, so building something up off the ground – in terms of steel and all the junctions, and how it works with a suspended slab – you have to trust your trades," he says.

he says. "That's the first time I've never had anything to rectify, at that stage!"

Low maintenance was part of the brief for this couple, who currently spend about one long weekend a month at their elevated steel house. "In future, when Ian retires, we'll spend weeks or even months at a time down there," Yvette says.

So what's it like to spend time in this idyllic location? "It's similar to my house in some ways but different, because it's elevated, so it's very lightweight upstairs and there is so much glass," Paul says.

"I was initially a little concerned about morning and afternoon sun, but we installed 1.2m-deep sun-shading, and in the afternoons, it's protected from low-angle sun by the trees.

"We also installed a number of louvre bays on the south elevation, so you can open up one of the big doors and the louvres to get the breeze in order to flush hot air out; that's one of the benefits of being on a raised platform: you are above the heat that radiates out of the ground.

"As a result, Ian and Yvette haven't felt overly hot or cold, and they've experienced it through each season."

Paul says he likes the fact that the couple deliberately retained a few dead trees around the house, to provide sculptural elements on the western side and habitat for wildlife. "It's quite interesting being elevated; it gives them a tree-house perspective on nature."

Despite being called Wilderness House, this home is just a short drive from Margaret River town, plenty of nearby wineries and the region's famous surf breaks. In essence, this steel home on stilts has all the attributes of a treehouse combined with a tent, without any negatives. It's the perfect place to hide in nature. **SP**

These COLORBOND® steel colours were deliberately chosen to work in accordance with the seasons and climatic conditions.

Paul says. "We put that at the east end, because they like to wake up with the sun. The core sits in the middle of the plan, and the kitchen and living area are to the west, to enjoy late afternoon sun.

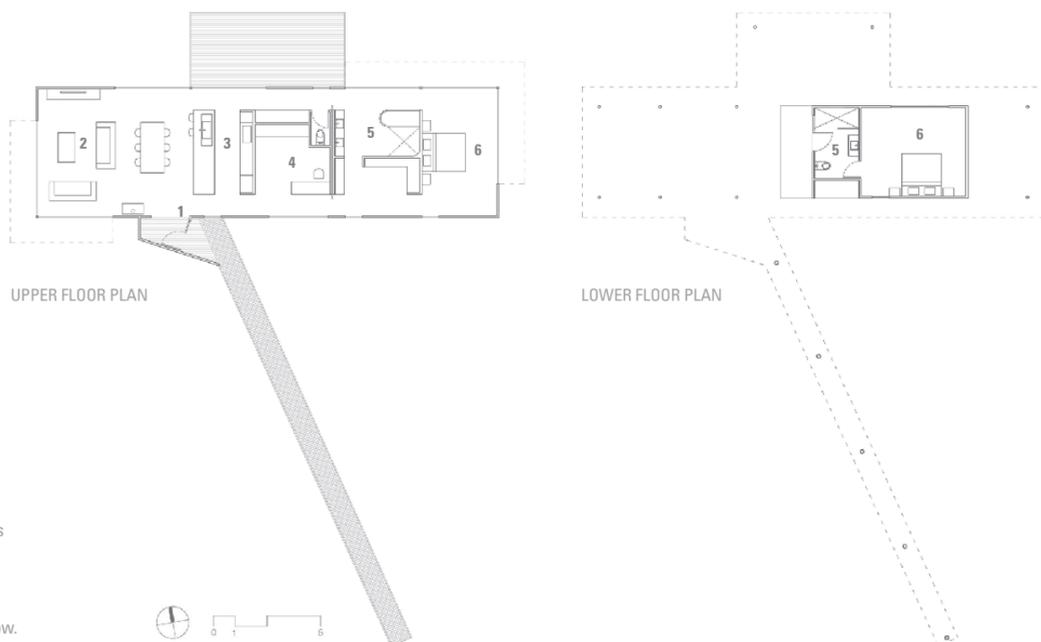
"We ended up removing the door from the toilet – it was the only one in the house – which again

"We worked well with the builder who used quality tradespeople, and the local steel fabricators were great, so it was a case of good teamwork.

"We had good dialogue between all the people in the team, and it meant that at the end-of-defects inspection there was nothing at all to rectify,"

LEGEND

1. Entrance
2. Living
3. Kitchen
4. Office
5. Bathroom
6. Bedroom



ABOVE AND BELOW: Large sections of glazing and banks of louvres act as operable walls to promote cross-flow; an effect that is enhanced by the home's elevated position. The owners enjoy being wrapped in the tree canopy, where they can observe birds at eye level, and kangaroos on the ground below.

PROJECT Wilderness House **CLIENT** Ian and Yvette **ARCHITECT** Archterra Architects **PROJECT TEAM** Paul O'Reilly, Matilda Brealey **PRINCIPAL STEEL COMPONENTS** Roofing: made from COLORBOND® steel in LYSAGHT TRIMDEK® profile, in the colour Shale Grey™. Walling: made from COLORBOND® steel in LYSAGHT SPANDEK® profile, in the colour Monument®. Structural steel: 114mm hot-dipped galvanised CHS columns to suspended slab; 150x50mm hot-dipped galvanised RHS deck framing; 89x89mm hot-dipped galvanised SHS columns to walls and internal wall bracing; 75x50mm hot-dipped galvanised UA sunshade framing; Entry ramp: hot-dipped galvanised Webforge grated steel with 50x50mm equal angle (EA) brackets and 50x50x4 mesh balustrade **BUILDER AND CLADDING CONTRACTOR** Hanrahan Construction **STEEL FABRICATOR** Margaret River Engineering and Supplies **SHOP DRAWING CONTRACTOR** Davey Drafting **STRUCTURAL & CIVIL ENGINEER** Cotan Engineering **BUILDING SIZE** 162m² **PROJECT TIMEFRAME** Design and documentation: 11 months. Construction: 12 months



The entry ramp references both oil rigs and national park viewing platforms, where steel walkways to spectacular viewpoints are common.

A meticulously planned and patterned wall cladding system made from COLORBOND® steel Matt in the custom colour Blush Brown is the dress-of-choice for this clever hospital expansion.

Words **Rob Gillam** Photography **Brett Boardman; Ian Davidson**



ARCHITECT
Architectus in association with HDR
PROJECT
Werribee Mercy Hospital – Stage 1C Acute Expansion Werribee Mercy Hospital – Stage 1C Expansion
LOCATION
Werribee, Victoria

A mark of a suburb on the rise, the expansion of this hospital in outer-west Melbourne started only a few years after the original building, the Catherine McAuley Centre, was completed.

As explained by Architectus principal, Ruth Wilson, Werribee's population growth has been rapid. "Wyndham City is a real growth corridor and, as part of it, Werribee has had to catch up with the huge population increase," says Wilson.

The partnership on the project with HDR was a division of responsibilities, with HDR handling interior and health planning, and Architectus leading the base building – the floors and structure, and facades.

With nowhere to build but upwards, Architectus was faced with a puzzle to solve in that health regulations and requirements had changed since the first double-storey Catherine McAuley Centre was built, dictating that the new hospital's four new levels – with six operating theatres, 64 in-patient beds and eight ICU beds – required a wider footprint.

Project architect, Len Parker, says "The square meterage was prescribed, so it was kind of like a Rubik's Cube we had to put together because the new building footprint could no longer fit over the existing one.

"To accommodate the requisite size of our building, it had to be outside of the existing building's floorplate and that meant extra stresses for the structure we were building on. There was also a height limit."

The architects fleetingly considered precast concrete panels for the walls but quickly realised weight would preclude them. "We needed something structurally sound yet also lightweight," says Parker. "The lightweight structural insulated panel (SIP) system clad in COLORBOND® steel

became key to meeting our structural engineering requirements and achieving the building envelope."

The panel system designed and constructed by cladding contractor, FacadeX, consists of an exterior rainscreen made from COLORBOND® steel which is fixed to steel sheeting that sandwiches a non-combustible insulation layer. The entire panel is fixed into a rectangular steel portal frame that runs around its perimeter and the panels 'clip' together using a weatherproof mating system.

FacadeX director, Robert Kennedy, expands that "The SIP is the weatherproof line and vapour-barrier line for the building. On the very outside of the insulated panel is an additional panel – an interlocking architectural panel made from COLORBOND® steel – which is an aesthetic layer,"

"We had the idea to lighten the palette and fragment the surface to really break down the large scale, to dissipate its visual bulk so it does not appear monolithic, despite its vast size."



ABOVE: The COLORBOND® steel colour scheme of Blush Brown and Thredbo White® was partially selected to pick up surrounding gum trees, whose trunks are also mimicked by the building's columns supporting the cantilever. The Blush Brown also ties in with the existing building.



WEST ELEVATION



NORTH ELEVATION

says Kennedy. "This is concealed screw-fixed to the SIP for a seamless appearance and acts as a rainscreen. All water and condensation moves between the panels, draining downwards out of the system."

Apart from punctuations of hooded windows, the walling system on the hospital's northern face is largely continuous. This forms a protective barrier that works on multiple levels. Ruth Wilson points out an obvious invader: the Princes Highway. "Because the street-frontage is on a major highway with lots of traffic, it's quite hostile. Patient rooms and operating theatres face out to the highway so there are obvious acoustic considerations."

These 'impenetrable', vast and sheer tracts of wall cladding are a departure from the approach employed in another of Architectus' projects featured in this title: 1 Bligh Street (*Steel Profile*® 113) – a transparent office tower swathed in huge spans of glass supported by frames made from steel plate by BlueScope, at the heart of which is a 130-metre-high light-filled atrium.

Venture inside Werribee Mercy Hospital (WMH) however and such light-tricks are joyously echoed. "We worked hard to ensure there's a lot of natural light to the floorplates, with generous amounts of glazing to the central courtyard and in general," says Wilson. "We also incorporated what's called a wellness sky-garden room, which is an indoor/

outdoor naturally ventilated respite room that gets away from the traditional hospital feel."

Given the risk of the wall appearing hulking and presenting an overwhelming scale, the architects put into plan a pattern that helps dissolve its form and also give it an iconic, beacon-like character. "WMH occupies an urban position that is highly visible from a number of viewpoints, so activating the campus' frontages was a vital civic and urban responsibility," says Wilson. "The new works had to have a contextual surface language, an architectural language at the facade, that can be read as a super-graphic scale from the highway."



EAST ELEVATION

"We had the idea to lighten the palette and fragment the surface to really break down the large scale, to dissipate its visual bulk so it does not appear monolithic, despite its vast size. Then it came down to what pattern to put on it. We adopted the QR code for the hospital as a starting point for that 'patterning'. That was the generator."

Also balancing the differing scales of the buildings is the huge LEGO® block-like cantilever made possible by giant 13-metre-high core-filled round steel columns that support the expanded floorplates. "By anchoring the upper levels to the ground at a corner, it enables them to have a more embracing

"The lightweight structural insulated panel (SIP) system clad in COLORBOND® steel became key to meeting our structural engineering requirements and achieving the building envelope."



The architects employed a scale-dissolving pattern that also gives the building an iconic, beacon-like character.

The huge LEGO® block-like cantilever allows the hospital expansion to escape the original building's floor plate.



presence," Wilson says. "This technique enables the new works to read as a companion building – one that provides a defensive and nurturing cover to the existing. Without this device, the existing building might appear weighed-under or crushed."

"We had a few tongue-in-cheek analogies about the new building and one of them was the spotted hen with an egg below it. We hoped for it to look like something nestling over and protecting it."

Helping give rise to the 'spotted hen' analogy, the building's permanent wall cladding is coloured in brown and white, with a temporary section of metal panels powder-coated in blue colours.

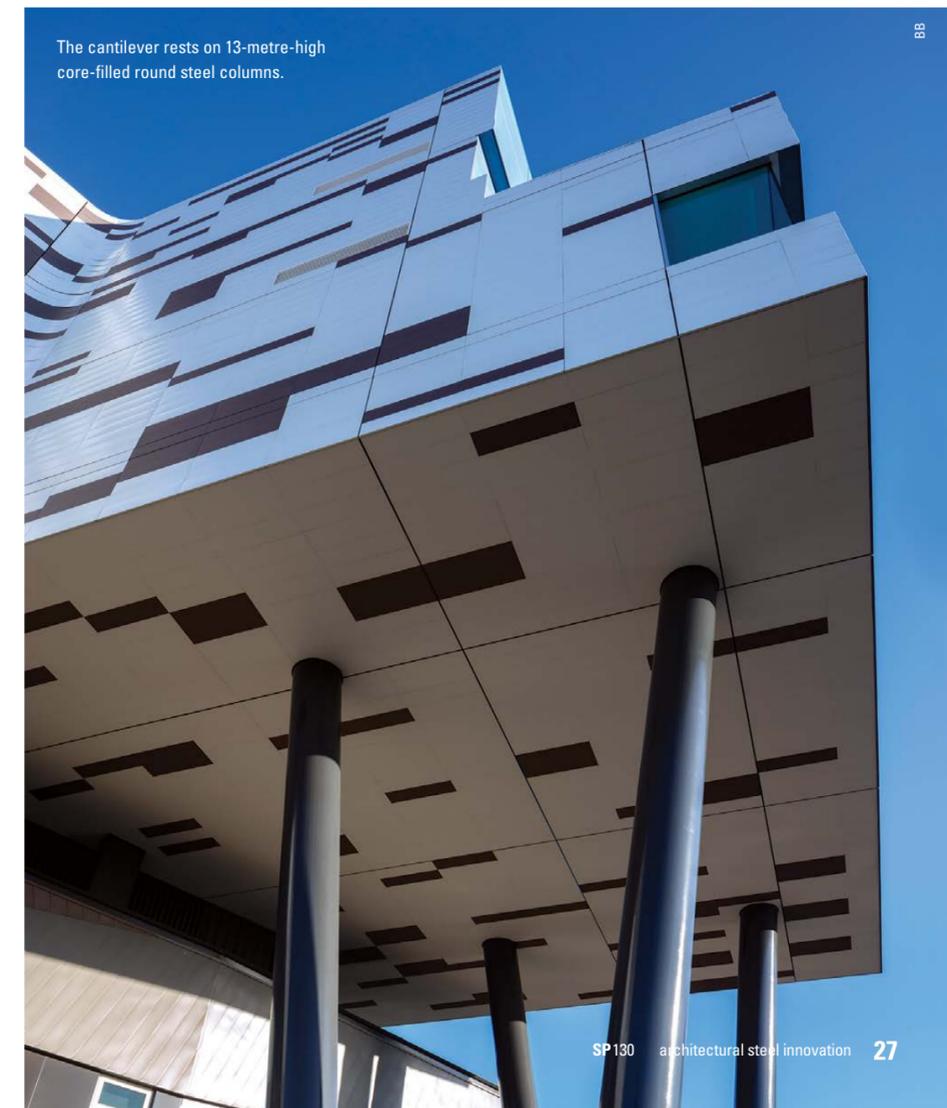
The vast majority of the building's wall cladding is made from COLORBOND® steel Matt in the custom colour Blush Brown and another COLORBOND® steel colour, Thredbo White®.

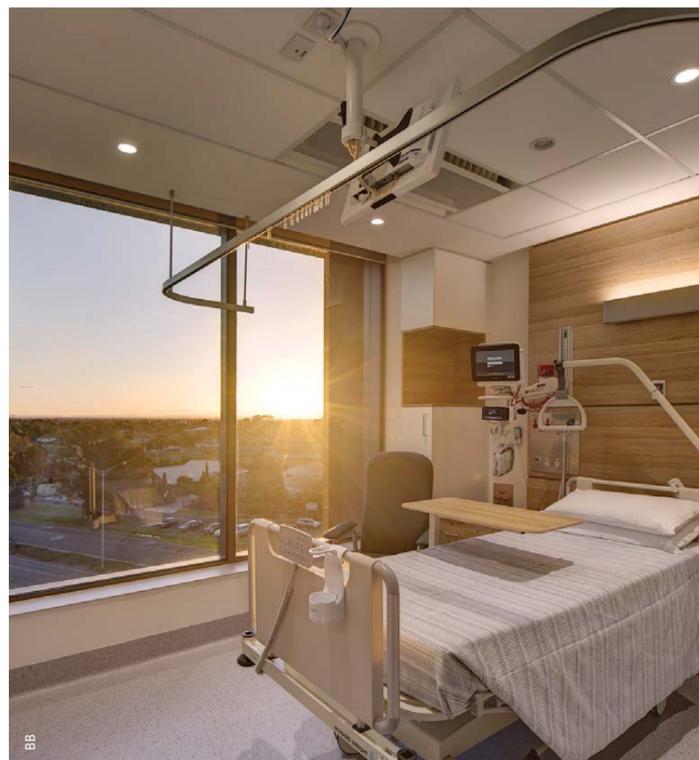
Len Parker says one of the reasons the colour Blush Brown (and to a lesser degree, Thredbo White®) was selected is that it picks up the surrounding gum trees, whose trunks also draw comparison with the building's cantilever columns.

"The Blush Brown colour was also chosen to tie-in with the older hospital's cladding colour scheme, says Parker. "We had a cladding colour on the existing building called Pigmento Red which is actually quite a burnished brown in appearance, and we wanted to take some of that colour through to the new building."

"We were trying to find a colour to match the zinc used on that project without blowing our very strict budget by actually using zinc in the same Pigmento Red colour. The team had quite a few conversations with BlueScope's specification account manager, Braden Leiner, to try to find a colour solution and he was very helpful." ❧

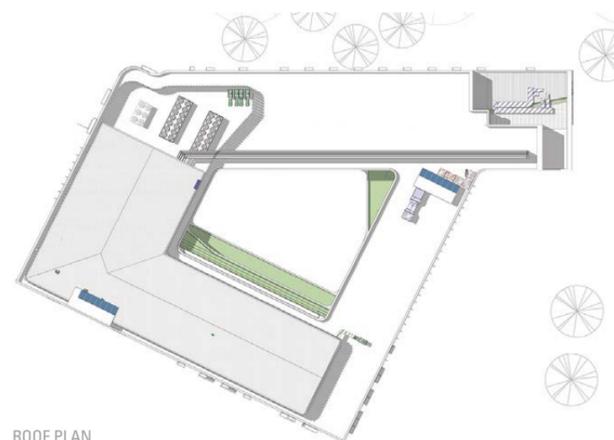
The cantilever rests on 13-metre-high core-filled round steel columns.





TOP AND BOTTOM LEFT: The architects ensured copious natural light reached the floorplates with generous amounts of glazing to the central courtyard. There is also an indoor/outdoor “wellness” sky-garden room for patients to enjoy.

ABOVE: Natural light and ventilation help create a departure from the traditional hospital.



ROOF PLAN

At the time of the search, BlueScope had recently released COLORBOND® steel Matt which creates a softer, subtle look by using special paint technology that diffuses light. Given the matching Blush Brown colour was going to be custom-made, Parker asked if it could also come in COLORBOND® steel Matt. “We had quite a few different samples and then decided on COLORBOND® steel Matt in the custom colour Blush Brown,” he says. “The Thredbo White® was also outside of the standard COLORBOND® steel colour palette in walling applications.

“From a distance, the two brown colours look quite similar. We’re very happy with how they harmonise.”

The architects were also happy with the speed in which the walling system was constructed and installed – especially given their remit was to build the new hospital on top of the old one while still in operation.

“That was the most significant consideration for this project because the two-level building below was already there and it maintained operation during the entire build,” says Wilson. “It was a quite extraordinary predicament – throwing up many structural and logistical challenges.

“There were a lot of hijinks involved but a very high level of consultation with the hospital from our builder, Multiplex, minimised disruptions by carefully planning the timing of noisy works.”

in their workplace by making them feel supported by the physical environment.”

And her favourite feature of the project? “Ultimately I think it’s an uplifting building. It has an element of intrigue but there’s also something friendly and positive about it – it has an overlay of friendliness that is uplifting. It’s natural for people to approach a hospital with trepidation and I hope that our hospital helps make it a more positive experience by conveying a sense of substance and professionalism.”

Len Parker chimes in: “There are studies that show a positive mindset helps healing and a purposely positive environment with all that calming, natural daylight and warmth promotes that.”

And his impression of the building, now that the practice’s hard work is done? “I went back a few months ago to complete the final defects walk-through, and when you come in through the car park and see the main entry colonnade, with its steel columns and the pattern of the brown and white COLORBOND® steel cladding that continues under the soffit*, it looks really amazing. Along with the greenery that has grown-in, it’s just a really inviting space. Also, the client is over the moon with the building. They think it’s fantastic.” SP

*For details on steel roofing and walling product selection, please refer to BlueScope Technical Bulletin guides TB 01A and TB 01B or call BlueScope on 1800 064 384.

“Studies show a positive mindset helps healing and a purposely positive environment with all that calming, natural daylight and warmth promotes that.”

Did the cladding system’s speed-of-construction help meet the architects’ goal of minimal disruption? “Yes, absolutely,” says Parker. “One of the key drivers all the way through was that we had to meet a tight timeframe, driven by considerations around when the building had to be operational. So, right from the outset we were looking at modular, prefabricated solutions to ensure a speedy facade erection. FacadeX’s system provided structural, thermal and acoustic properties, all in one. It was really efficient and ticked all the boxes to allow us to get around the issues we were facing, such as Australian Standard fire-rating compliance.

“The efficiency of this system contributed to the overall speed of the program, with the entire project completed in 18 months – two months ahead of schedule.”

Is the healthcare category something the practice likes to work in, given it provides key services to the community and improves quality of life? “Absolutely. We’re all about improving peoples’ daily lives in the sectors we work in, improving the conditions of the fabric people live and work in, and hospitals are a key part of that,” says Wilson. “Obviously that’s important for the patients and their families, but it’s also important to consider the nurses and doctors



ABOVE: The panel system consists of an exterior rainscreen made from COLORBOND® steel which is fixed to steel sheeting that sandwiches a non-combustible insulation layer. The entire panel is fixed into a rectangular steel portal-frame that runs around its perimeter and the panels ‘clip’ together using a weatherproof mating system.

PROJECT Werribee Mercy Hospital – Stage 1C Acute Expansion **CLIENT** The Department of Health and Human Services Victoria **ARCHITECT** Architectus in association with HDR
PROJECT TEAM Ruth Wilson, Len Parker, Rosemary Burne, Ian Davidson **PROJECT** Werribee Mercy Hospital – Stage 1C Expansion **PRINCIPAL STEEL COMPONENTS** FacadeX wall cladding (rainscreen): interlocking architectural panel made from COLORBOND® steel Matt in the custom colour Blush Brown, and COLORBOND® steel colour, Thredbo White® **BUILDER** Multiplex facade **CLADDING DESIGN & CONSTRUCTION** FacadeX **STRUCTURAL, CIVIL & FACADE ENGINEER** Bonacci Group **LANDSCAPE ARCHITECTS** Aspect Studios **PROJECT TIMEFRAME** January 2017 to August 2018 **BUILDING SIZE** 8850m² **TOTAL PROJECT COST** \$87 million

PANEL SAYS

This is a confident building, with its giant pieces perching on each other and dynamically cantilevering out like super-scaled children’s building blocks. Speed-of-construction was crucial to minimise disturbance to the working hospital and an efficient interlocking panel system was devised for off-site fabrication and rapid erection. The comparatively lightweight walling system is clad in COLORBOND® steel Matt in the custom colour Blush Brown – along with Thredbo White® – and its patterns successfully serve to visually break down the scale of the enormous northern wall protecting the hospital from the bustling Princes Highway. The building’s identity can be clearly read, even at speed by passing traffic, appearing like a mother hen brooding over its chick.

A brief for a design that showcased the construction skills of the owner-client, combined with a difficult site and orientation have delivered a lauded Red Centre example of ingenuity, in this building for a builder made from COLORBOND® steel.

Words **Micky Pinkerton** Photography **Peter Barnes; Susan Dugdale & Associates**

UNDER THE FOOD

ARCHITECT
Susan Dugdale & Associates

PROJECT
MPH HQ

LOCATION
Ciccone, Alice Springs, Northern Territory

Alice Springs has an unforgiving environment. It's miles from anywhere, surrounded by four deserts and sports such extremes of temperature that you might need a calculator to work out the swings. Not a comfortable environment to build in, so it's no surprise that the place was born of necessity – rather than desire – in the 1870s as a repeater station to extend the range of the Overland Telegraph Line. It remained a lonely outpost for telegraph operators until gold was found in the region and since then successive waves of industry has brought people and development to Alice.

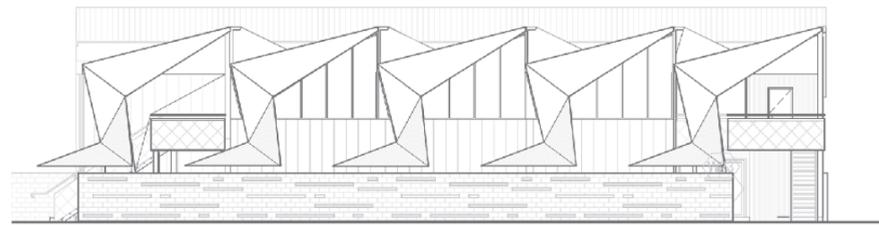
Whilst gold might have kick-started permanent European settlement on traditional owners, the Central Arrernte people's land, architect Sue Dugdale observes that another metal has had a more enduring contribution to the town's built environment. In a landscape where Spinifex is the dominant flora and the local stone is hard to work with, steel has become a popular material for construction.

"There's a strong local history in working with steel," explains Dugdale. "It comes from the mining industry and the agricultural industry, so a lot of builders have good steel skills as opposed to timber. We don't use timber at all and that's partly environmental, it's harsh here and there's also high termite activity, which makes timber unsuitable."

Dugdale arrived in Alice over 20 years ago and her small team at Susan Dugdale + Associates has a passion for discovering and developing a unique regional architectural identity based on the particular culture, climate and geography of central Australia.

In this liminal town, contrasts in culture and economy are ever-present and Dugdale carefully considers both in the context of each project and client.

It's an approach that has produced numerous award-winning designs and ample opportunity to work with steel. Steel can be found where you'd expect it, in the structures and cladding of the practice's commercial and education buildings, but also in a number of thoughtful, delightful public domain projects such as the super-scale, multilayered and multicoloured Kilgariff Fence (see *Steel Profile*® 129) – which



SOUTH ELEVATION

is made from COLORBOND® steel in LYSAGHT TRIMDEK® profile – and the structures of the CBD revitalisation works which feature intricately patterned steel shade screens.

This skill of celebrating both the aesthetic and structural attributes of steel are again present in Dugdale & Associates' recent commercial project, a headquarters for a local building company. Located on a prominent corner of a light industrial area, the brief was for a work shed and administration facility that showcased the company's capabilities. With the shed placed on the street frontage for practical reasons, that left an awkward wedge for the office areas. Facing SSW these had excellent views to the MacDonnell Ranges but were exposed to the hottest afternoon sun that the Alice could offer.

The architectural solution to the site attributes and orientation was a series of large enveloping sunhoods which carefully exclude almost all direct sun whilst nonetheless allowing for expansive views from inside. These angular,

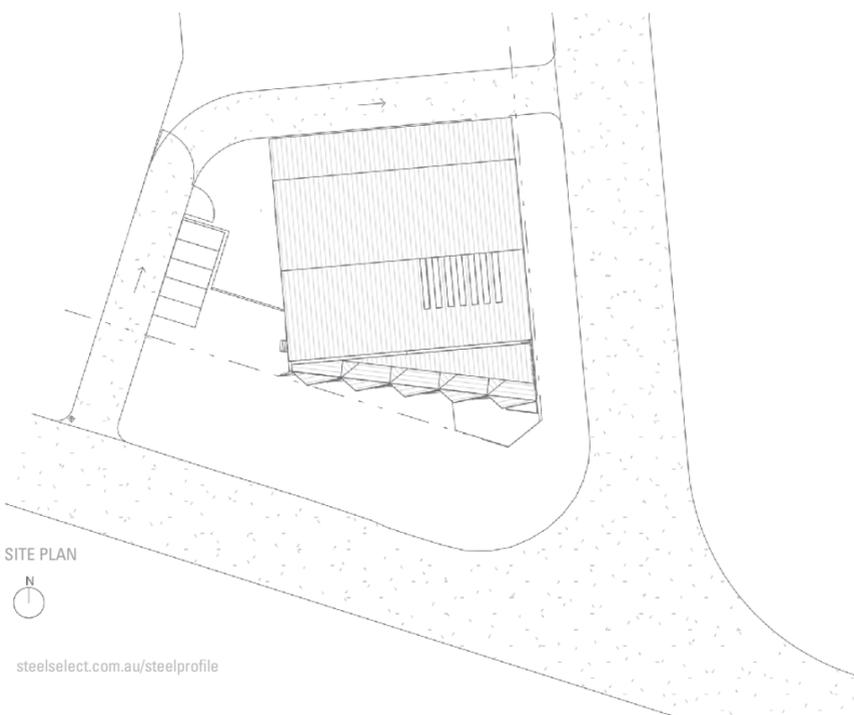
cupping forms also provide a magnificent visual attraction for passing traffic.

The crystalline, geometric forms presented new challenges for both architect and builder.

The structure of the origami-like sunhoods – like much of the rest of the building – was achieved with purlins and girts made from roll-formed GALVSPAN® steel. The hi-tensile steel possesses a strength-to-weight ratio 60 percent greater than traditional hot-rolled steel and has a minimum zinc coating of 350 grams per square metre, providing excellent corrosion resistance and durability in this location, which is not a particularly corrosive area.

From a construction perspective, the installation of the sunhoods was complicated by powerlines along the site border. The builder opted to pre-fabricate and pre-weld the sunhoods, then crane them over the powerlines and into place. The structural integrity of the hoods was achieved once they were supported and made rigid on the building via multiple fixing points. ➤

"They're ambitious as a three-dimensional form, particularly for us as a small practice and documenting them in 3D, and I don't think they could have been built in anything but steel."



SITE PLAN



PANEL SAYS

Charged with creating a new headquarters that suitably flaunts its builder-client's capabilities, Susan Dugdale & Associates wouldn't settle for a boring shed with some tacked-on offices. A series of zig-zagging, origami-shaped sunhoods made from COLORBOND® steel in LYSAGHT CUSTOM ORB® profile, in the colour Windspray® are the main performative device. These belie a simple base form and provide the project's distinctive identity – their dynamic yet pragmatic geometries managing scale and cleverly providing dual functions of aesthetics and protection from a harsh orientation. Only 'grunty' materials would do for this project, with the almost entirely steel building being ideal for termite-prone Alice Springs. Though practical, it is far from utilitarian and demonstrates how a clear design focus can generate a strong architectural result.



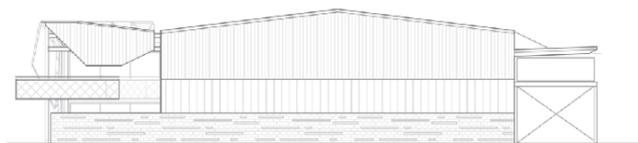
ABOVE: Facing a busy road, the building's geometric, origami-like sunhoods provide a visual highlight for passers-by in an otherwise typical light industrial area.

LEFT: The building is exposed to the west in the afternoon but the angular, enveloping forms of the sunhoods exclude almost all direct sun, while still providing staff and visitors views out to the MacDonnell Ranges.

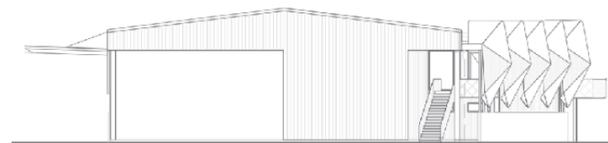
BELOW: Owing to site construction challenges, the sunhoods were prefabricated and pre-welded off-site using purlins and girts made from cold-rolled GALVSPAN® steel and then craned into place over the nearby powerlines.



The main shed walls are made from COLORBOND® steel in LYSAGHT CUSTOM ORB® profile, in the colour Windspray®, matching the cladding of the sunhoods.

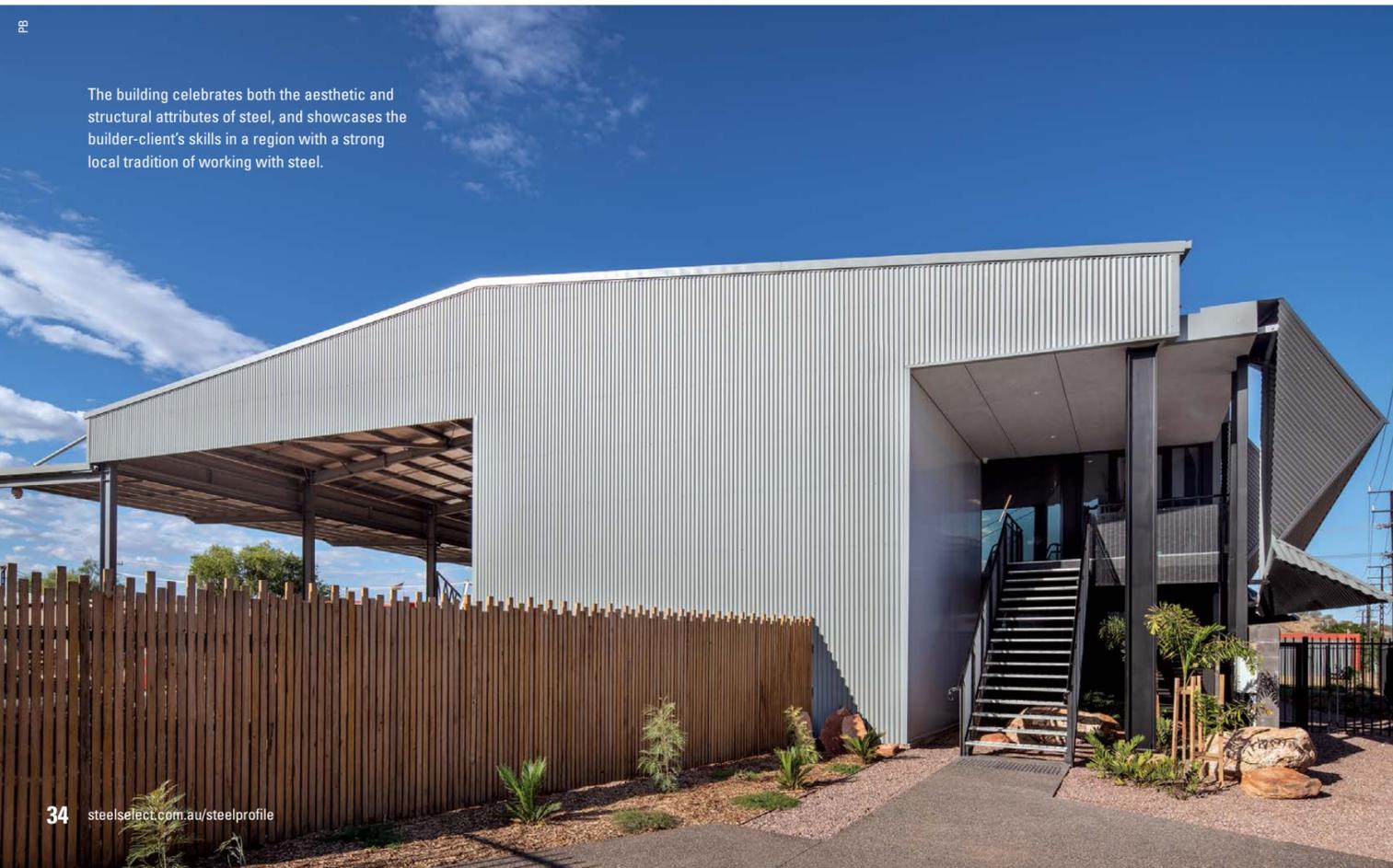


EAST ELEVATION



WEST ELEVATION

The building celebrates both the aesthetic and structural attributes of steel, and showcases the builder-client's skills in a region with a strong local tradition of working with steel.



"We hadn't done anything quite like that (the sunhoods) on any other projects," says Dugdale. "They're ambitious as a three-dimensional form, particularly for us as a small practice and documenting them in 3D, and I don't think they could have been built in anything but steel. We also used more mid-scale steel elements in this project compared to our previous work – for example the industrial mesh flooring on the external spaces such as the decks, and in the balustrades."

The patterned geometries of the sunhoods support cladding made from COLORBOND® steel in LYSAGHT CUSTOM ORB® profile, in the colour Windspray®.

The colour Windspray® was selected as the best to accommodate a dusty environment, where trucks are passing frequently, as well as to provide continuity between the sunhood facade and the work shed which forms the building's core.

The work shed operates as a dynamic space that changes from day-to-day as vehicles and materials for worksites come and go. The long, open edge of the shed faces due north, providing shade in

that relies on the properties of steel instead of propping the slab with conventional plywood formwork. There's a huge time-saving in not having to wait a month or more for the concrete to cure. DECKFORM® steel stays *in situ* and becomes part of the structural integrity of the building."

Whilst steel might be the product-of-choice for Dugdale in the desert through necessity, for her it's also a reliable material with creative potential. "I find it fun to detail with steel because you just know it can be done," she says.

She also appreciates the high degree of manufacturer support for her chosen steel building products. "There are so many good steel products on the market, they're developed well and the information available on them is really good. You can easily find out how far materials can span, the thickness and their performance, their installation instructions, how far it can project past its last support and so on. And when you can rely on good information you can then try to use it in unusual ways. We've taken that CUSTOM ORB® profile information from LYSAGHT® to create these sun hoods, for example. The technical

person who wrote those specifications couldn't have visualised it, but that information made those sunhoods possible."

Dugdale's favourite aspect of the project is how it has provided a working example of cost-effective, well-designed industrial architecture – a new reference point for the local profession and beyond.

"All across Australia, in these highway strips and light industrial areas, there's a big shed with a little office stuck on the front," she says. "It's often two storey, it's often tilt-slab concrete, it's just the bare bones of what is needed to house the administrative functions. There's usually minimal aesthetic appeal, no environmental credentials or performance. The MPH HQ project is still a big shed with a two-storey admin area, but it gels much more. It's taken a building type in the Australian landscape that ninety-nine percent of the time is not architecturally designed and is showing what's possible without great cost."

The end result is a building that expands the typology and validates the extra effort builder and architect went in achieving it. SP

"There's a huge time-saving in not having to wait a month or more for the concrete to cure. DECKFORM® steel stays *in situ* and becomes part of the structural integrity of the building."

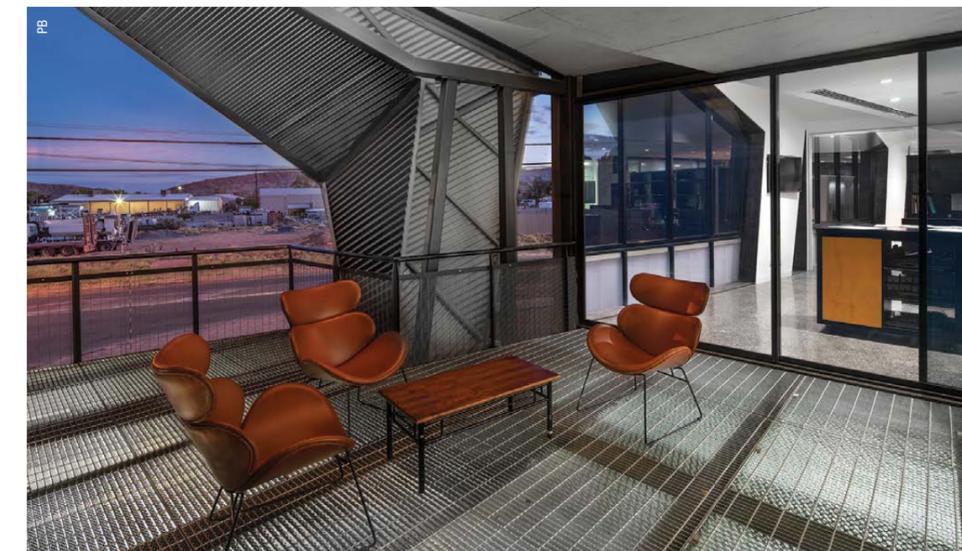
summer and sun penetration in winter, offsetting the sub-zero temperatures that builders face in early morning starts.

This main shed's roofing is made from COLORBOND® steel in LYSAGHT TRIMDEK® profile in the colour Windspray® and – to match the sunhood cladding – its walls are made from COLORBOND® steel in LYSAGHT CUSTOM ORB® profile, in the colour Windspray®.

The building's deck was made from DECKFORM® steel in LYSAGHT BONDEK® Structural Steel Decking profile. This acts as formwork for the concrete slab flooring on the first floor. In tandem with the concrete, the permanent steel formwork provides tensile reinforcement, creating a composite slab that can be lighter and stronger than conventional systems.

Dugdale had used DECKFORM® steel in LYSAGHT BONDEK® profile before and recommends the economic advantages of using the product.

"Lost formwork – formwork that remains in the pour – is a very efficient construction technique



The concrete slab first floor is made from DECKFORM® steel in LYSAGHT BONDEK® Structural Steel Decking profile. On the external deck, the use of steel continues with industrial mesh flooring, a cost-effective selection and in keeping with the building's industrial character.

PROJECT MPH HQ CLIENT MPH Projects **ARCHITECT** Susan Dugdale & Associates **PROJECT TEAM** Sue Dugdale, Miriam Wallace, Flynn Carr **PRINCIPAL STEEL COMPONENTS** Shed roofing made from COLORBOND® steel in LYSAGHT TRIMDEK® profile in the colour Windspray®; Sunhoods, shed and wall cladding made from LYSAGHT CUSTOM ORB® profile, in the colour Windspray®. Structural steel; Purlins and girts made from GALVSPAN® steel; flooring made from DECKFORM® steel in LYSAGHT BONDEK® Structural Steel Decking profile **BUILDER & CLADDING CONTRACTOR** MPH Projects **STRUCTURAL CONSULTANT** NJA Consulting **SHOP DRAWING CONTRACTOR** CUBIC Steel **LANDSCAPE ARCHITECTS** Arid Edge Environmental Services **AWARDS** Australian Institute of Architects Northern Territory Chapter Awards: 2019 COLORBOND® Award for Steel Architecture; 2019 The Tracy Memorial Award (best across all categories); The Peter Dermoudy Award for Commercial Architecture; 2018 LYSAGHT Inspirations Design Award: Commercial **FLOOR AREA** 1026m² **PROJECT TIMEFRAME** 2015-2018



CROWN JEWEL

Perth's stadium and parkland facilities on the Burswood Peninsula harness the strength of steel to take sports and entertainment experiences to the next level.

Words **Lucy Salt** Photography **Peter Bennetts**

ARCHITECT
HASSELL, COX Architecture and
HKS Architects, in association

PROJECT
Optus Stadium

LOCATION
Perth, Western Australia

Underpinned by a voluminous yet visually lightweight structure made from approximately 7500 tonnes of BlueScope steel, Perth's Optus Stadium has rapidly fulfilled the design vision for a distinctly Western Australian, world-class sports and entertainment facility.

Since opening in late 2017, the stadium has garnered a swag of awards, key amongst which was the 2018 Australian Institute of Architects National COLORBOND® Award for Steel Architecture and the National Award for Public Architecture – the former described by the jury as “a compelling and worthy contribution to Australia’s steel architecture tradition.”

The brief called for a world-class, fans-first stadium fully embedded within an active public realm – an ambition that would become the reigning mantra for the competition-winning design team lead by HASSELL in association with COX Architecture and HKS Architects.

The brief also sought to challenge Western Australians’ car-dependence by calling for 80 percent of patrons to arrive by public transport.

“It was a big, brave move by the Barnett Government, against everybody’s recommendations,” says Peter Dean, principal at HASSELL’s Perth office.

For their part, HASSELL, COX and HKS all immediately recognised the project’s potential as a game-changer for the Western Australia capital. Here was an opportunity to take a long-neglected, relatively isolated site and restore it for the public’s enjoyment. “We all shared a vision for the whole-precinct approach and how the site could be regenerated, and returned to the people,” says Matthew Batchelor, director at COX Perth. The steel superstructure allowed the metal wall cladding to be highly discontinuous and light, to make the stadium as

transparent and connected to the landscape wherever possible. “It looks quite solid from the outside, but the discontinuities – along with the extensive glazing – mean that as you’re walking through it you’re connecting back to the landscape,” Batchelor says.

“We don’t get sites as good as that very often,” says Paul Hyett, the London-based director of sports at HKS. “It’s the most beautiful setting on a bow in the river and visible from parts of the city.”

In many ways, steel is the ultimate hero of the project. “The steelwork gives the building its aesthetic appeal and character,” says Hyett. “Steel is the most wonderful material for architects, it combines incredible strength within relatively small sections and it’s also something which you can easily form and shape.

“The roof of that building, with the cantilevered steel trusses tied at the back and the way in which that roof is working, structurally, is expressed in its appearance. The combination of the steel and the fabric has given the most incredibly light feel to it,” he says.

BlueScope supplied all of the primary steelwork – 4500 tonnes of welded beams and columns and 3000 tonnes of XLERPLATE® steel – via WA distributors, InfraBuild. Another 1350 tonnes of steel decking was supplied by Fielders and LYSAGHT®.

The architects say steel was integral to the construction program of the five-level superstructure and the ambitious design performance requirements of the ‘floating’ roof structure. Featuring more than 15,000 fabricated steel components, the works included the installation of 50 major structural trusses that support the tensile fabric roof canopy that shelters up to 85 percent of spectators.

The architectural and structural geometry of the roof was also developed to address an ambitious program requiring pre-fabrication, as well as transportation and erection challenges. The cleverly designed pin-joint system with tolerances to absorb differential movements across the structure below, and to allow fine-tuning to ensure alignment of the leading edge, results in a stunning and efficient halo roof solution.

For Dean, it was important that materials were expressed honestly – with all primary steel structure coloured white, and a grey secondary steel structure – to create a decipherable building lexicon.

“As a muse, steel’s malleable, adaptable form has been interrogated extensively, from its piled structure to help overcome difficult ground conditions, large spans in the roof trusses for obstruction-free views, feature columns, beams and seating bowl rakers, ➤

“Steel is the most wonderful material for architects, it combines incredible strength with relatively small sections and it’s also something which you can easily form and shape.”



Extensive glazing enhances intrigue.



The steel superstructure provides framework for the stadium's transparency, connecting it back to the landscape wherever possible.

PANEL SAYS

This impressive sports and events facility in Perth has an arresting appearance which makes the most of its magnificent waterfront location. Sited on a peninsula opposite the CBD, the stadium is accessed from all sides, and delivers on its promise of a ‘fans-first’ experience, both inside and outside the arena. BlueScope supplied all of the primary steelwork – 4500 tonnes of welded beams and columns and 3000 tonnes of XLERPLATE® steel – that is pivotal to the project’s success. The design reveals exposed columns, beams and pin-joints that express a monumental skeleton supporting vast sections of high-level glazing. This strong and visible framework enables the peripheral circulation spaces to be naturally lit, and to capture views outwards in all directions. Inside the main arena, a delicate steel-framed, lightweight roof canopy provides protection from the elements, further enhancing the spectator experience at this world-class facility.



EAST ELEVATION



Steel columns keep fans closer to the field-of-play, rather than lifting them further away from the action. Steel was integral to the ambitious design performance requirements of the 'floating' roof structure.



The architects aimed for a world-class, fans-first stadium embedded within an active public realm and have delivered with aplomb.

to the dramatic geometry of the pedestrian arbour," Dean says.

"The generous spans in the trusses allowed us to get large elements, such as function rooms, underneath the seating bowl without transferring any structural columns out," he continues. In addition, the steel columns facilitated consolidated services to minimise costs and keep fans closer to the field-of-play, rather than lifting them further away from the action.

"There was a lot of engineering and collaborative work with Arup and Multiplex to refine the design of the steel frame members, and particularly the truss," says Batchelor, who describes the finely detailed pivot-knuckle joint designed into the truss base which allowed the trusses to be placed relatively simply – mitigating the need to work at height as much as possible.

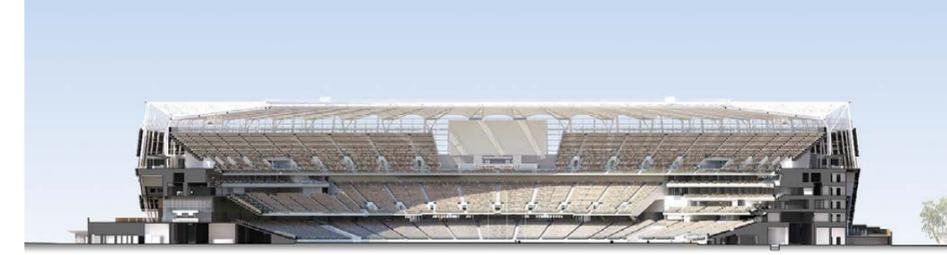
The trusses themselves were fabricated by Cimec in nearby Hendersen, then transported to site where all the cladding elements, including the fabric roof modules, were added and craned up as a single element. "At the height of construction we had nine trusses down on the ground being assembled while one was being lifted into place, it was a really interesting construction program," says Batchelor.

The construction and erection methodology was a key innovation, agrees Dean. With construction proceeding with basement works at one end and roof works at the other, the cantilevered, triangular trusses were designed to free-stand after three bays were erected. "The roof had to be free-standing because it was never complete until the last bay went together," says Dean.

The way the design was transferred into fabrication is, for Dean, an under-recognised aspect to be celebrated. "The fabricators went through hell and high water over an 18-month period to deliver the project on time. It's no easy feat, particularly with a fast-tracked project, and a constantly evolving design."

Of his experience in Perth, Hyett says "On this occasion we were able to fuse the ability and the commitment of Australians to good architecture with the Australian love of sport. It was a wonderful marriage and I was very happy to be there in the middle."

What matters about the stadium for Dean is that the architects have created a memorable Western Australian emblem, and in turn have set a new benchmark for what people in WA expect from these kinds of projects: "Usually you say there have been compromises, but this project got better and richer because of peoples' commitments. It was a career-defining moment for everyone involved. SP



SHORT SECTION LOOKING WEST



TOP: The pin-joint system is designed with tolerances to absorb differential movements across the structure below, ensuring alignment of the leading edge for a stunning and efficient halo roof solution.

ABOVE: The primary steel structure is coloured white and the secondary steel structure grey, to create a decipherable building lexicon.

PROJECT Optus Stadium **CLIENT** Weststadium **ARCHITECT** HASSELL, COX Architecture and HKS Architects, in association **PROJECT TEAM** Peter Dean, Alastair Richardson (design architects), Matthew Batchelor, Brenden Kelly (project architects), Peter Lee, Paul Hyett, Patrick Vereker, Bradley Anderson, Toby Hitzman, Robert Hardie, Mark Ainsworth, Reuben Bourke, Phil Davies, Kaine Jenkins, Robin Deutschmann, Patrick O'Neil, Carl Tappin, Mark McKenna, Clare Dawson, Suzy Wright, Thanhsun Su, Felicity Komorowski, Irene Payne, Greg Howlett, Chris Smiles, James Allison, Nigel Saul, Derek Tallon, Renae Prisov, Jonathan Chong, Vicky Vu, Hannah Beck, Carolyn James, Daryl Guido, Fathmath Evans, Luke Gay, Jeremy Graham, RJ Estacio, Filae Gil, Merlyn Santos, Jonathan Southgate, Partho Dutta, Stuart Harder (architectural team members), Narelle Corker, David Russell, Zoe King, Yvette Petit, Amanda York, Louise Buckingham, Natalie Grier (interiors team members), Anthony Brookfield, Sarah Gaikhorst, Hannah Galloway, Douglas Pott, Aysen Jenkins, Hannah Pannell, Nicholas Pearson, Jill Turpin (Landscape team members) **PRINCIPAL STEEL COMPONENTS** Structural steel: 4500 tonnes of BlueScope welded beams and columns. 3000 tonnes of XLERPLATE® steel; 1350 tonnes of steel decking supplied by Fielders and LYSAGHT® **STEEL DISTRIBUTOR** InfraBuild **BUILDER** Multiplex **STEEL FABRICATOR** Cimec Construction and Engineering **SHOP DRAWING CONTRACTOR** Cays Engineering (secondary steel structure) **CLADDING CONTRACTOR** Yuanda Australia (rainscreen) **STRUCTURAL & CIVIL ENGINEER** Arup Group **LANDSCAPE ARCHITECTS** HASSELL **PROJECT TIMEFRAME** 2013 - 2017 **AWARDS** 2018 Australian Institute of Architects National COLORBOND® Award for Steel Architecture and National Award for Public Architecture. 2018 Australian Institute of Architects Western Australia Chapter Awards – COLORBOND® Award for Steel Architecture, George Temple Poole Award, Jeffrey Howlett award for Sustainable Architecture. 2018 Australian Institute of Landscape Architects Western Australia Chapter Awards – WA Medal for Best Project, Play Spaces Award of Excellence, Urban Design Award of Excellence **BUILDING SIZE** 175,000m² in a 41-hectare site **TOTAL PROJECT COST** \$900 million

SUNKEN TREASURE

A pedestrian bridge – proudly adorned with sculptural ribs made from XLERPLATE® steel and TRU-SPEC® steel – is an evocative landmark in this rejuvenating coastal city. Words **Rob Gillam** Photography **Jackie Chan**

Having recently undergone extensive redevelopment, the roughly one-kilometre stretch of foreshore at Koombana Bay is a lovely place to be. The area has a darker past, though, with many early mariners cruelled by the bay's north-west gale that has trapped a known 15 sailing ships in its shallows – the last being wrecked in 1923. These shipwrecks were one of the inspirations Phil Gresley of Gresley Abas drew from, for the bridge design.

“Our brief was to better-connect the new foreshore with a 5-metre wide pedestrian bridge that spans over the inlet,” says Gresley. “We wanted to create a landmark but it was important to give it meaning, not just do something fancy. We wanted to draw from the knowledge of the site and connect back to that.”

“This is such an important place for the Elaap Wadandi (Saltwater) people. Conversely, there are these historical elements of whaling, bones and emerging hulls of wrecked ships. The bridge also references storms and projects a visual effect onto its white ribs via a programmable lighting system.

“The bridge can be interpreted in many different ways, but it is all related to its place and that generated the design idea,” Gresley says.

Charged with overseeing the wider foreshore development, engineers Cardno worked with the architects to refine the structural system for the bridge's arching ribs made from XLERPLATE® steel

in AS/NZS 3678-250 grade and TRU-SPEC® steel coil plate in AS/NZS 1594-HA250 grade – predominantly in 12mm and 8mm thicknesses.

Cardno's senior principal, Geoff Pereira, says the rib design went through a series of design evolutions before arriving at a cross-section which was both structurally efficient and also simple to fabricate. “An open angle's shape is rigid, but able to twist easily – much like the shape of a flat plate or perhaps a ruler on your desk,” Pereira says. “We required a closed section, or tube section, which is rigid and also ‘torsionally’ stiff.”

“Working collaboratively with Gresley Abas, our teams conceived a rib cross-section which comprised two folded angle sections that were nested toe-to-toe. The shape developed was structurally efficient whilst also being efficient to manufacture using traditional fabrication methods. Interestingly, the final shape echoed that which nature has evolved for a whale rib.”

Cardno then asked local steel fabricators, Hotweld, to work up a full-sized prototype as proof of concept and to confirm the proposed fabrication methods and the suitability of the final shape, and finishes. The prototype also contractually represented the quality to be achieved during manufacture of the remaining ribs.”

Hotweld director Rick Cassagrande says collaborating on the prototype was a welcome

challenge. “The prototype was a bit finicky, but we're not scared of jobs like that,” he says. “It was about interpreting the drawings and getting the detail right, then making sure we could make it work by rolling and pressing the XLERPLATE® steel correctly.

“Then it was about getting it how we wanted it, visually, because in this case it had to perform visually as well as structurally. We had to take extra care to get the aesthetic that the architect wanted and we think the final effect is rather nice.”

Both architect and engineer take great pride in the way locals have embraced the project. “To have people appreciate the projects you're involved in is pretty neat and this one is well regarded by the community – everyone talks about it,” says Cardno's Pereira.

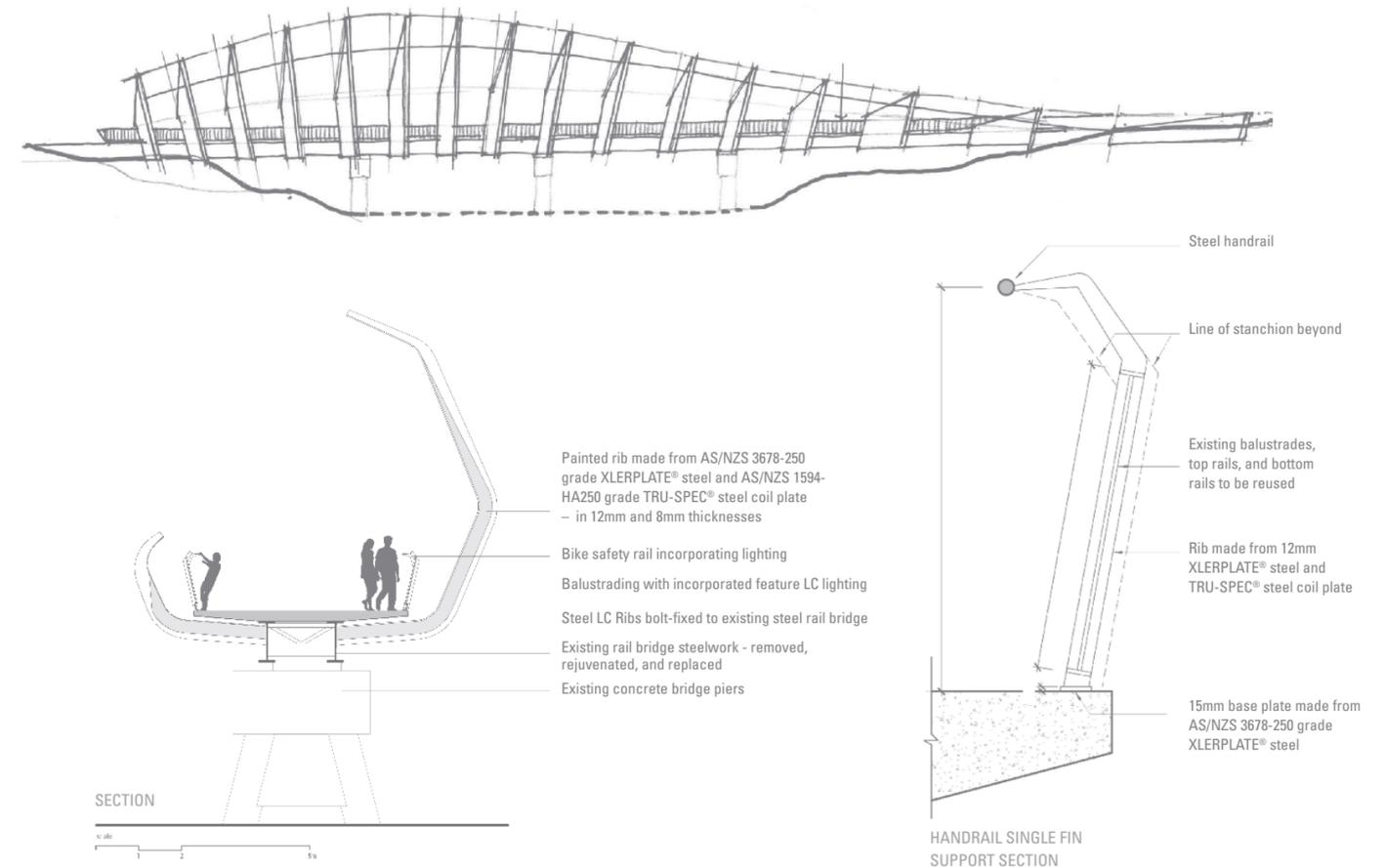
“The city is trying hard to create something special to draw people in. Everyone heads to our Margaret River wine country and the roads run around Bunbury so people skirt around it, but as a result of the bridge I've gained a greater appreciation of the city. It has renewed my interest in the area and I have taken my family back a few times to enjoy it.”

Phil Gresley agrees: “The community reaction has been wonderful. I get to regularly visit Bunbury and it's great to engage with the bridge in action. I'm really proud of our work but I think the community also exude a certain pride about it.

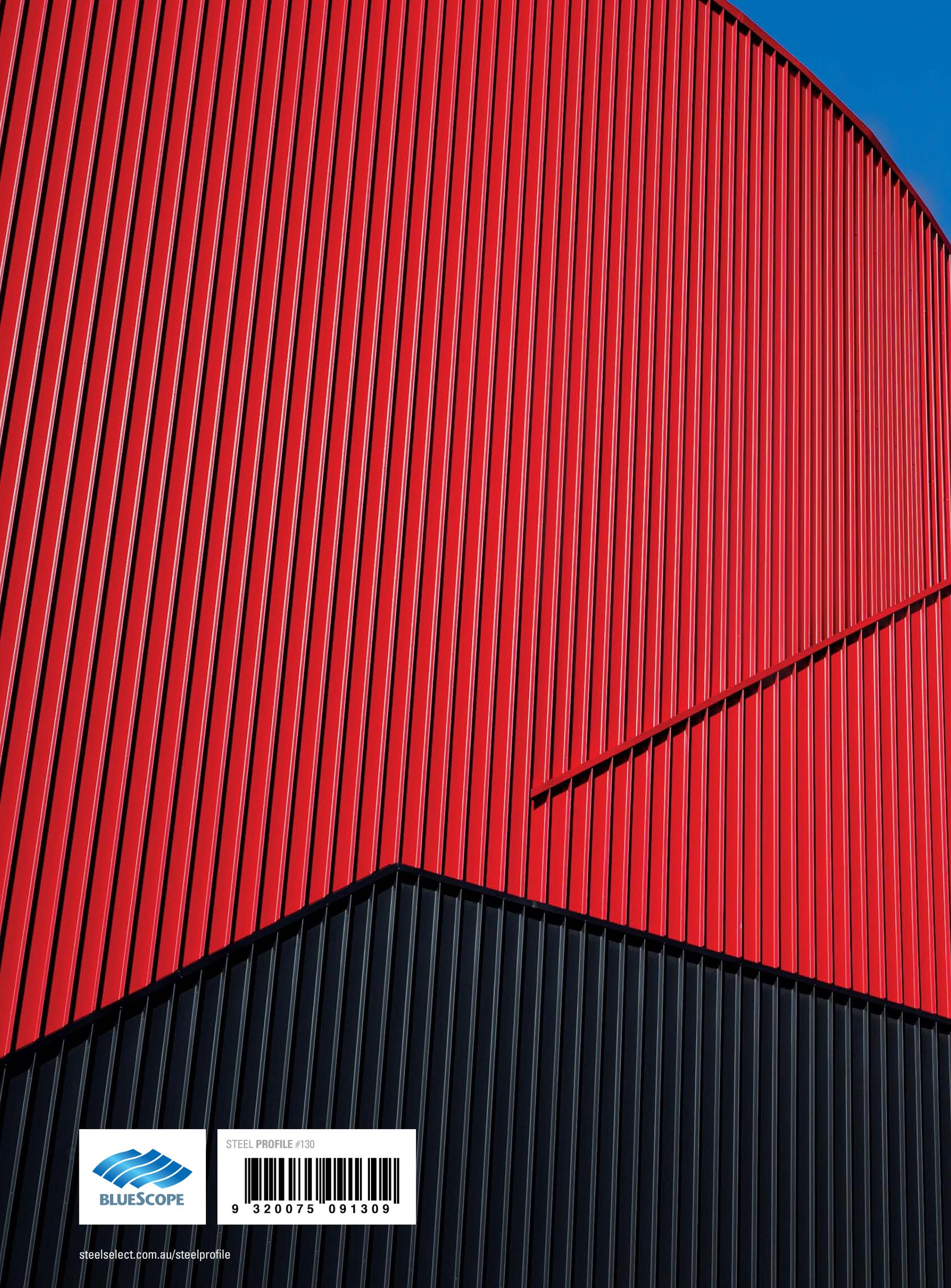
“Bunbury is going through a wonderful contemporary transformation. It has some pretty sophisticated public art and provides a high level of amenity for residents and visitors.

“I see the bridge as sculptural but as an architect I don't consider it art. It's a landmark structure and a piece of interpretation. It embeds the place into its design, intertwining Indigenous and European narratives and the steel helps achieve that.” **SP**

“The shape developed was structurally efficient whilst also being efficient to manufacture using traditional fabrication methods. Interestingly, the final shape echoed that which nature has evolved for a whale rib.”



PROJECT Koombana Bay Foreshore Pedestrian Bridge **CLIENT** City of Bunbury **ARCHITECT** Gresley Abas **PROJECT TEAM** Philip Gresley, Greg James, Ryan Deyonker
INTERPRETATION Apparatus **PRINCIPAL STEEL COMPONENTS** Sculptural ribs made from XLERPLATE® steel in AS/NZS 3678-250 grade and TRU-SPEC® steel coil plate in AS/NZS 1594-HA250 grade – predominantly in 12mm and 8mm thicknesses **BUILDER** Ertech **STEEL FABRICATOR** Hotweld **STRUCTURAL & CIVIL ENGINEER** Cardno
LANDSCAPE ARCHITECTS Cardno **PROJECT TIMEFRAME** August 2016 – December 2017 **AWARDS** 2019 Australian Institute of Architects Western Australia Chapter Awards – Urban Design, 2019 Australian Coastal Award – Annual Achievement, Parks & Leisure Australia Awards for Excellence – Park of the Year **TOTAL PROJECT COST** \$12 million



STEEL PROFILE #130



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