106
AUGUST 2010
ARCHITECTURAL
STEEL INNOVATION
WITH BLUESCOPE STEEL

STEEL PROFILE

WOOD MARSH
AUSTRALIAN PAVILLION, SHANGHAI

COX ARCHITECTS
NORTH MELBOURNE RAILWAY STATION

LINDSAY AND KERRY CLARE
PARTNER ARCHITECTS

EDITORIAL

Welcome to *Steel Profile* #106.

As always, it is with great pride that we deliver you a selection of this country's most interesting and innovative steel architectural projects.

As the Principal Corporate Partner of the Australian Institute of Architects, we have been impressed by the standard of this year's state-based National Architecture Awards winners. Projects such as these are pinnacles in our architectural landscape and we are pleased to note the intrinsic role steel has played in shaping many of them.

The projects for this issue have been selected with considerable deliberation. We trust you will enjoy them.

Please feel free to share your thoughts via info@steelprofile.com.au

Manu Siitonen
BlueScope Steel editor

EDITORIAL ADVISORY PANEL

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

ADAM HADDOW

Adam is an elected Councillor of the NSW chapter of the Australian Institute of Architects and a director of SJB Architects in inner-city Sydney.

He was awarded the 40th Anniversary Churchill Fellowship in 2006, to study alternatives to conventional models of urban design.

More than anything, he loves to design and construct buildings

FRANK STANISIC

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

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

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

DANIEL GRIFFIN

Joint winner of the 2008 COLORBOND® Steel Biennale Prize, Daniel works for McBride Charles Ryan Architects and is currently teaching architecture at the University of Melbourne.

His award-winning architectural thesis at RMIT – where he is establishing a Humanitarian department – examined the urbanisation of Palestinian refugee camps

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COVER PROJECT
Australian Pavilion at Shanghai World Expo 2010
PHOTOGRAPHER Peter Bennetts

NUMBER 106, AUGUST 2010
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AUSTRALIA ON SHOW

The complex curves of the Australian Pavilion at Shanghai World Expo 2010 were simple to construct, thanks to a new panelised cassette system that makes building with weathering steel easy.

Words **Alex Taylor** Photography **Peter Bennetts; Katarina Stuebe**

ARCHITECT Wood Marsh Architecture
PROJECT Australian Pavilion
LOCATION World Expo 2010 Shanghai, China

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RIGHT: The Australian Pavilion resembles a monolith, thanks to the precision of BlueScope Facade Solutions Azure™ panels

BELOW: The Pavilion is a favourite with Expo visitors, including these Chinese Army soldiers at a pre-launch event

As the architects responsible for the Geelong Ring Road and the Australian Centre for Contemporary Art (ACCA) on Melbourne's Southbank, the team at Wood Marsh has amassed significant expertise in the design and delivery of weathering steel structures. Their latest offering – the Australian Pavilion at Shanghai World Expo 2010 – has benefited from recent innovations in technology in multiple ways.

For the Australian Pavilion commission, which Wood Marsh won in an open competition in partnership with creative design firm Think!OTS, Wood Marsh aimed to represent Australia's Red Centre in an abstracted and sculptural way – especially Uluru and Kata Tjuta – to evoke images of the landscape that most international visitors readily associate with Australia.

"When ACCA was completed, people remarked that although angular in form, it evoked the Red Centre, so it became the reference point for our design concept for the Australian Pavilion," explains Wood Marsh project architect Antony Martin. "It was important for the pavilion to be both uniquely Australian and an excellent piece of design."

By installing BlueScope Facade Solutions Azure™ panels made from XLERPLATE® weathering steel that were customised to the architect's specifications, the design and construction team hastened the building process and achieved a level of precision that was not previously possible.

"Weathering steel was always central to that design idea," Martin adds, "because the nature of the material relates to the patina and ochres associated with the Red Centre."

According to Australian Pavilion organisers, Wood Marsh's innovative design responds admirably to the Expo theme by embodying Australia's approach to smart manufacturing, design and environmental sustainability.

"Australia's is a striking national pavilion, where targeted trade and investment promotion activities, and associated cultural and communications programs, will further enhance our already strong bilateral links with China," says Australia's Commissioner-General Lyndall Sachs. "Consistent with the Expo theme, 'Better City, Better Life', our pavilion promotes Australia's cities, which are consistently ranked amongst the most liveable in the world."

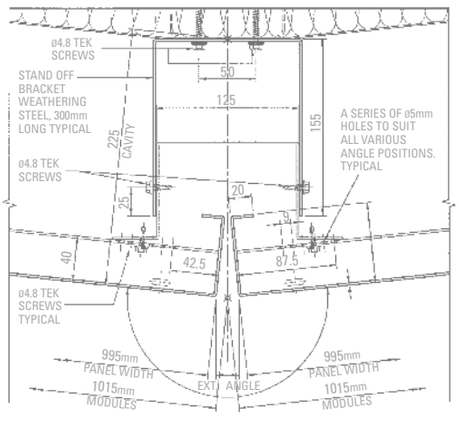
Internally, the pavilion accommodates up to 40,000 visitors each day in three distinct public areas designed by creative design firm Think!OTS. *Journey* takes visitors past six exhibition elements in the 160-metre long, glass-enclosed ramp that wraps around the facade and punctures its skin. At the pavilion's heart, a 1000-person capacity theatre-in-the-round showcases an audio-visual spectacular in *Discover*, while *Enjoy* comprises food, beverage and retail offerings in a 15m high atrium, with an elevated gallery for cultural performances. The pavilion also features a 250m² VIP zone overlooking the atrium.

The launch of BlueScope Facade Solutions' Azure™ panels simplified the installation of XLERPLATE® weathering steel cladding since Wood Marsh completed the ACCA project in 2002 and since construction of the Geelong Ring Road began in 2006. BlueScope Facade Solutions now provides a one-stop-shop for design, fabrication and construction solutions.

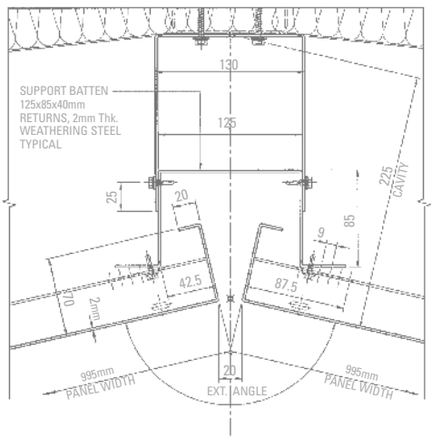
"We had initially considered commissioning a custom panel system that would have been designed specifically for this project," Martin says, "but after being approached by BlueScope Facade Solutions in December 2008, we didn't have to.

"As sponsors of the Australian Pavilion, BlueScope Steel was familiar with our winning scheme, and they became involved with the facade design, supply and installation at an early stage of the process," he explains. "I travelled to Sydney with client representatives to see the Penrith Government Office Building [see *Steel Profile* #103] in construction. Based on what we saw there, I made certain requests in relation to panel size and joint specifications – and Facade Solutions was able to produce panels that fulfilled our requirements."

According to Martin, the new cassette panels offer several key advantages over earlier weathering steel cladding systems. "The most significant difference in the construction methods employed was that at ACCA the weathering steel formed the weatherproof skin of the building, whereas at the Australian Pavilion it acts as a rain screen," he says.



70mm SIDE FLANGE DEPTH PANELS FOR CONVEX CASES



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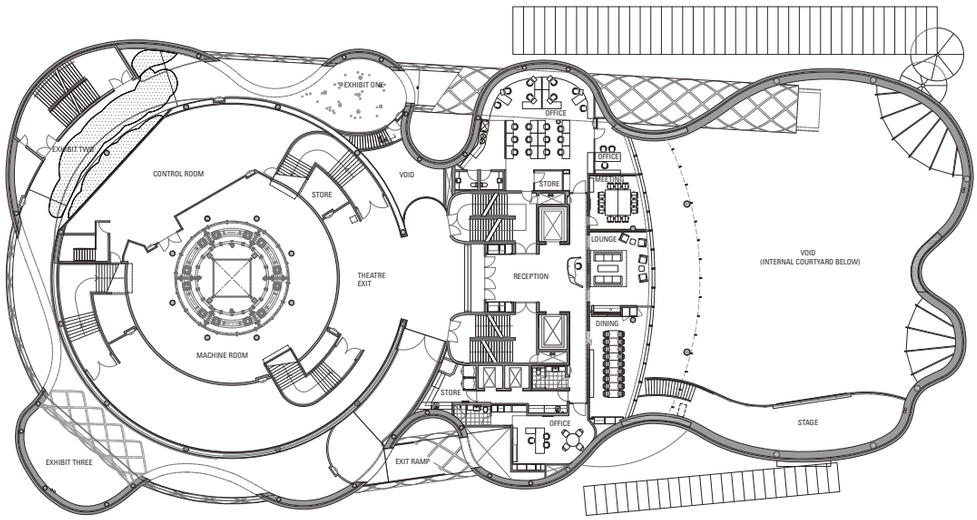
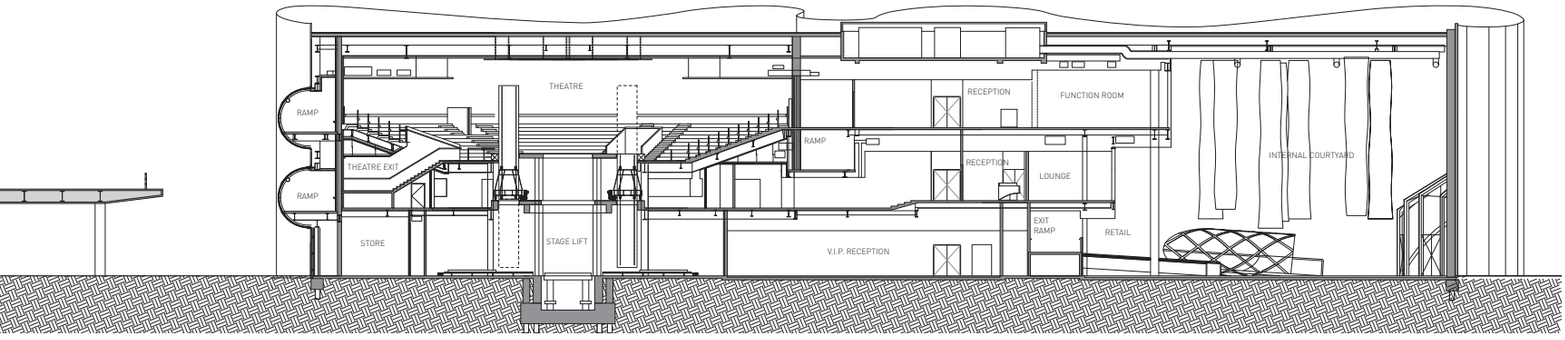
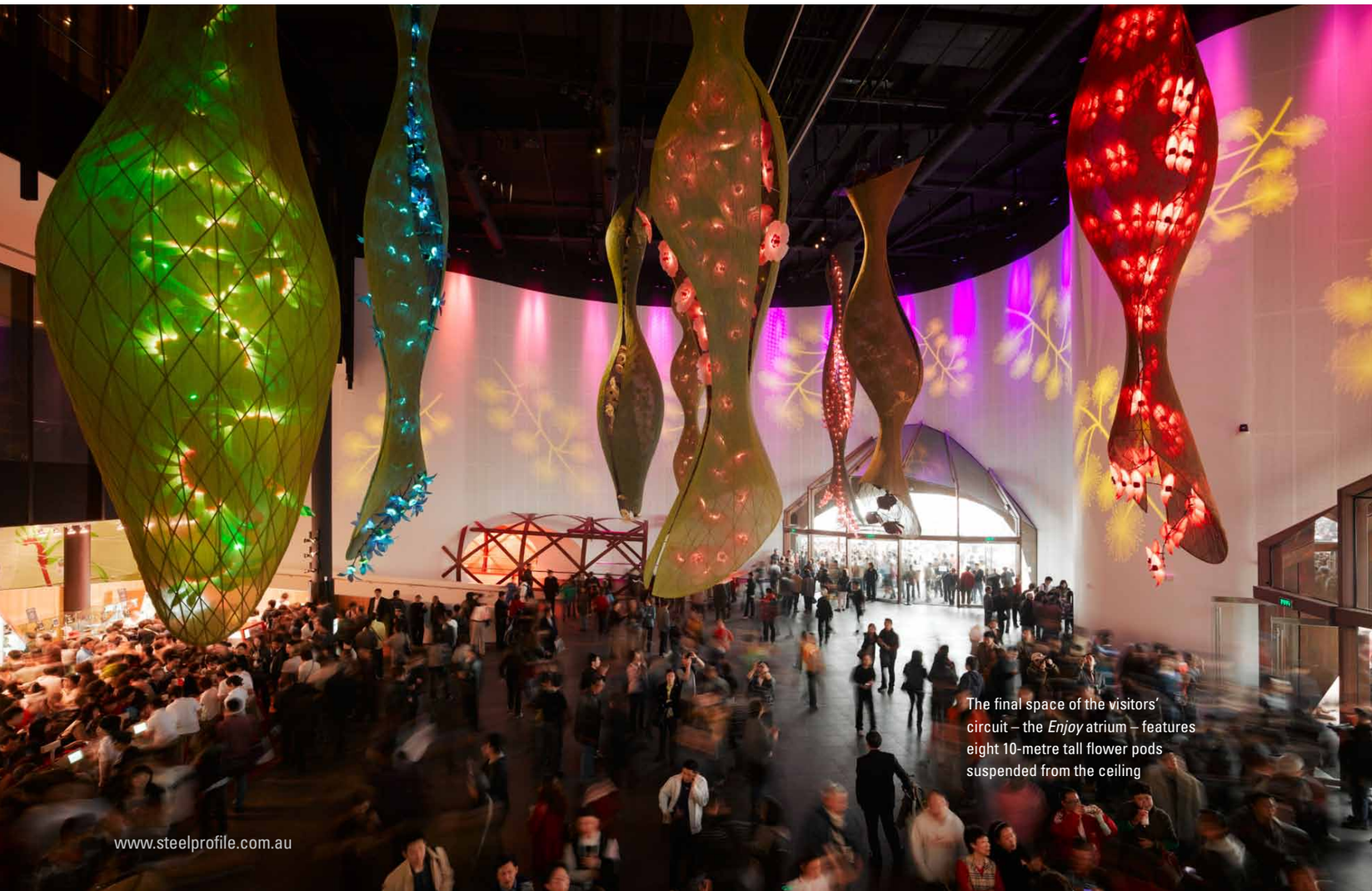


"It was important for the pavilion to be both uniquely Australian and an excellent piece of design"





The final space of the visitors' circuit – the *Enjoy* atrium – features eight 10-metre tall flower pods suspended from the ceiling

Inside the Pavilion, vivid displays, live performances and striking artworks help visitors *Journey*, *Discover* and *Enjoy* Australia's unique offerings

The Azure™ panels that fit around the circulation 'tubes' were cut to size onsite, using templates prepared in Australia

The panelised system enabled the pavilion to be built in China by local workers employed by the head contractor, Bovis Lend Lease Projects Shanghai, using a combination of locally sourced structural steel and BlueScope Facades Azure™ panels.

"The crew that installed the facade was excellent," Martin says. "Once they mastered the sequence of the installation, they were able to move very quickly around the building, and it took just two months to complete the cladding."

The speed and ease of construction were important considerations in the specification of Azure™ panels, given the tight timeframe leading up to the official opening in May 2010. In addition, the simple task of removing the panels will ensure a smooth disassembly when Expo concludes.

"All the facade panels can be simply removed and reinstalled, regardless of the form or shape of a subsequent building," Martin says. "It's very easy to unpack the panels, and we kept the packaging, so that they can be shipped back to Australia for reuse afterwards."

However, there was another even more compelling argument for specifying the Azure™ panels, according to the architect. "The ability to ensure minimum tolerances and precise alignment in the panels was the most important factor," Martin explains. "It meant we were able to achieve minimal horizontal seams and therefore convey the monolithic appearance we desired."

The building owes its sinuous curved walls and undulating roofline to the flawless precision of the Azure™ cassette system. "All of the 'tube' penetrations were cut on-site from templates, but the parapet panels were cut to size in Australia," Martin explains. "You can see the precision that we were able to achieve through the smooth and curving parapet line. The fact that the panels were all prepared in Australia so that the workers could assemble them without delay was outstanding."

Martin says that construction on-site proceeded free of unexpected challenges because the design and construction team had undertaken rigorous preparation and testing beforehand. The complex structure was designed in Melbourne using a combination of CAD and Rhino, with comprehensive shop drawings produced in China using TEKLA 3D modelling software. "The primary structural frame was enormously complex given the plan, and the fact that you have a central theatre which is wrapped with circulation and exhibition spaces," Martin says.

"We were running to a very tight time frame – the building had to be built in just 12 months, and we had a non-negotiable completion date – so we had to be certain of everything in advance.

"We had a prototype produced of the facade system, which I inspected several times in Sydney before it was shipped to China, so that the local workers could see how it would all come together," he says.

"We did everything in our power to avoid running into difficulties on site," Martin adds. "In addition, Bovis Lend Lease established a quality control program to sign off on key stages of the construction, and I visited Shanghai as part of that process every four to six weeks during the installation, to inspect the progress."

Now that the building is open to visitors, it has taken on a life of its own, with streams of people moving through the pavilion each day. A constant flurry of visitors activates the spaces in and around the building, and the facade is anything but dull and boring, thanks to the unique qualities of XLERPLATE® steel.

"One of the most important things about weathering steel is that it develops a patina that will change over the course of the Expo," Martin says, "so the building is not necessarily a static object: its colours will change over time, depending on the prevailing weather, and by changing sunlight throughout the course of the day.

"We developed a very careful lighting plan based on our experience with ACCA," he adds. "The in-ground lights have an orange lens and are concentrated on the convex portions of the plan, so that the reading of the building changes dramatically at night."

While Antony Martin was in Shanghai putting the finishing touches on the building, several soft opening events took place prior to Expo's official launch, and the architect was thrilled with the crowd's reaction to the design. "When I was there on a VIP day, there was an enormous queue to enter. People are amazed by the pavilion, it's a very popular building," he says.

Part of its appeal surely derives from its unmistakable 'Australian-ness', Martin concludes. "One of the aspects that we are most proud of is that, while some of the other pavilions boast amazing architecture, they are not necessarily representative of their countries, but the Australian Pavilion manages to do both," he says. "Weathering steel was at the centre of our design concept: it's the form and material that best represents the unique landforms of the Red Centre." SP

PANEL SAYS

The concept and sculptural form of this eye-catching building is extremely provocative, giving it an immediate presence in what is likely to be an exceptional field of buildings by well-known architects from around the world. We are interested in the potential of the unusual tubes that encircle and penetrate the facade, which recall the hulking mass of the desert vehicles in the *Star Wars* film.

PROJECT Australian Pavilion, Shanghai World Expo 2010 **CLIENT** Department of Trade and Foreign Affairs **ARCHITECTS** Wood Marsh Architecture **DESIGN DIRECTORS** Roger Wood and Randal Marsh **PROJECT ARCHITECT** Antony Martin **STRUCTURAL ENGINEER** Bovis Lend Lease Technical Services Group **BUILDER** Bovis Lend Lease Projects Shanghai **PRINCIPAL STEEL COMPONENTS** Roof and wall cladding: LYSAGHT KLIP-LOK 406® profile made from COLORBOND® steel in the colour Manor Red®; Facade: BlueScope Facades Azure™ panels made from XLERPLATE® weathering steel **COMPLETION DATE** March 2010 **BUILDING SIZE** 7500m² **TOTAL PROJECT COST** $83 million (construction and exhibition)

BIGGER THAN BIG

WORLD EXPO 2010 IN PERSPECTIVE

Even in the context of the world's biggest expo stage, the Australian Pavilion is a record-breaking project of mammoth proportions.

Words **Alex Taylor**

Australia has a long history of participation at world exhibitions – Melbourne's Exhibition Buildings date from the 1880 event that city hosted – but the Shanghai World Expo 2010 is our most ambitious and expensive undertaking yet. Where the Australian Pavilion at Aichi in Japan attracted 3.5 million visitors in 2005, Shanghai World Expo 2010 organisers hope to lure seven million visitors into the Australian Pavilion, from an anticipated 70 million attendees.

The Expo site comprises 528 hectares of prime land alongside the Huangpu River with the Chinese Pavilion at its centre, surrounded by 170 smaller pavilions grouped by continent and region. Some of the more striking designs include the UK Pavilion by Thomas Heatherwick, with a porcupine-like facade that incorporates the 'Seed Cathedral'; the wicker basketwork skin of the Spanish Pavilion by Miralles/Tagliabue EMBT; Buchner Bründler Architects' knitted aluminium and solar cell curtain for the Swiss Pavilion; and the golden sand-dunes of the United Arab Emirates Pavilion by Norman Foster.

The Australian Government spent $61 million constructing its Pavilion and exhibits, with a further $22 million sourced from business sponsorship and state governments. Over Expo's six-month run, the Australian Pavilion will employ about 160 bilingual workers to inform, entertain and serve the mainly Chinese visitors.

Australian organisers are hoping that Expo will foster and strengthen business links between Australia and China, particularly in the areas of financial services; green building and renewable energy; resources; biotechnology, education; and information and communications technology.

"Over the 184 days of the Expo, our VIP facility will play host to over 200 targeted business program events including seminars, policy roundtables and promotions, all designed to broaden and enhance bilateral and commercial bonds between China and Australia," said Australia's Commissioner-General Lyndall Sachs.

Tourism is another sector likely to benefit, with the number of mainland Chinese visitors to Australia expected to grow by 11 per cent over the next five years, spurred on by the enticing cultural displays and interactive exhibits within the Pavilion.

Soft launch events augured well for the official opening and beyond, Sachs said, with busy queues translating into happy visitors. "I am delighted with the very positive reactions of our visitors to the Australian pavilion," she said. "The look of anticipation on their faces as they waited patiently was matched by the very happy expressions as they completed their journey of discovery of Australia, its history, culture, products, food and beverages and our hopes for the future. I am pleased to hear so many of our visitors to the pavilion saying that it was worth the wait."

THE ART OF MAKING PLACES

If, as prominent Queensland architect Brit Andresen claims, "the purpose of architecture is to contribute to [making] us more at home in the world", Lindsay and Kerry Clare have reached the pinnacle of their profession. In a partnership spanning 35 years, the husband-and-wife team has racked up many notable achievements, including the 2010 Australian Institute of Architects 2010 Gold Medal for Architecture. Words **Rachael Bernstone** Photography **Paul Bradshaw**

From their earliest design projects – starting with houses on the Sunshine Coast – to their largest and most recent works – such as the Gallery of Modern Art in Brisbane (as directors of Architectus) – Lindsay and Kerry Clare have approached each new brief with the same purpose and intent.

"When you look back, we have managed to produce a lot of projects and building types with many different teams, but there is a consistency of approach that exists from the early projects right through to the current jobs," Lindsay Clare says. "We have a set of principles that we are still working with today, which involves finding the rationale from the brief, context and site, and using the richness of that to develop the architecture. We don't need abstract theories to design our buildings."

The Clares – who have been personal and professional partners for more than 35 years – first observed that approach at the elbow of legendary Sunshine Coast architect Gabriel Poole, in whose office they met as young students. At Poole's suggestion the young couple took an interest in the published works of Finnish architect Alvar Aalto, which helped them to refine their design thinking to the point where they felt compelled to visit Finland with their children, to experience Aalto's buildings for themselves.

"We loved the way Aalto dealt with topography, light, landscape, tradition, and many other factors," Lindsay says. "He made spaces that people can occupy and live with for a long period of time. Seeing Aalto's architecture in the flesh helped us to understand issues that working with Gabriel had taught us."

JOHN GOLLINGS

Gallery of Modern Art – Architectus

LINDSAY & KERRY CLARE

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LEFT: Lindsay and Kerry Clare would like to undertake more public housing projects, following the success of the Cotton Tree Housing complex on the Sunshine Coast

OPPOSITE CLOCKWISE FROM TOP LEFT: Cotton Tree Housing (1992-95); University of the Sunshine Coast Chancellery (2006); Thrupp and Summers House interior and exterior (1987).

On their first trip, the Clares visited many of Aalto's most famous buildings such as Finlandia Hall and the architect's own house in Helsinki; university projects at Otaniemi; the church, town hall and library at Seinäjoki; most of the Aalto buildings at Jyväskylä and Saynatsalo, and the cultural buildings at Rovaniemi.

"We discovered that his buildings have a richness to them that is much greater than what's conveyed in books, but we had missed some key structures so we went to Finland a second time," Lindsay explains. "During that trip we were invited to have lunch with Aalto's wife [Elissa Mäkiniemi, who died in 1994] at the Experimental House at Muuratsalo with our children, which was a fantastic experience."

Like their design heroes, the Clares interrogate the brief and site to unearth the "found potential" of each project, borrowing the term from Canadian husband-and-wife architects John and Patricia Patkau. According to Patricia Patkau: "This 'found potential' may include such aspects as site, climate, building context, program, local culture, or anything that will facilitate the development of an architectural order which is evocative of the particular circumstance."

Using "found potential" to underpin design means that buildings can contribute to a culture's sense of identity, John Patkau adds. "One of the important ways that a people or a culture defines itself, that is to say creates meaning, has to do with the interaction of the general and the particular – a necessary interaction which establishes associations which allow us to make sense of both," he writes. "It is only by defining our generality in the context of particularity, and our particularity in the context of generality, that we establish who we are in the world."

> "We may have only 10 years of designing left, so we are refocussing our efforts on areas where we feel we can make a positive contribution"

In the Clare's case, this approach has produced more than 100 houses – mostly in south-east Queensland – which sit well within their surroundings. They respond to the sub-tropical climate with shading, overhangs, eaves, shutters, blinds and hoods to keep out the sun. They boast "thin plans" where every room connects to outdoor space or veranda, or a ventilating clerestory skylight, which facilitate cross-ventilation. They are light weight and economical in their choice of materials, often employing steel in the form of framing, wall cladding and roofing, which imparts an unpretentious yet elegant appearance to their buildings.

In effect, their houses are so firmly rooted in place that they become timeless, a point that is beautifully illustrated by the Thrupp and Summers house. It was completed in 1987, and re-photographed by John Gollings in 2008, while he waited for the rain to clear at the nearby University of the Sunshine Coast Chancellery (see *Steel Profile* #100). In the intervening decades, the owners have barely altered the house – the furniture is much the same as appears in the earlier Peter Hyatt photographs – and it occupies its bushland setting as elegantly and effortlessly as it did when newly completed.

Part of this grace arises from the Clares' careful consideration of materials and their appropriate application. The Cotton Tree Housing complex on the Sunshine Coast (1992-95) is a case in point. "With a mix of social and private dwellings sitting side by side, and inserted in amongst existing trees, the pilot project aimed to provide a viable alternative to the 'brick veneer dwellings with basement car parking' that were gradually creeping over the beaches of the Sunshine Coast," Kerry says. On that project, corrugated steel cladding was selected for its thermal properties and to reference the familiar materials of traditional Queenslander homes.

To the Clares' regret, that acclaimed housing type has not been replicated elsewhere, although affordable housing and urban design are two of

the key areas they intend to focus on in the future. "That project was deemed to be a success in 1994-95 and since, but we've never received another commission like it," Lindsay says.

"We are looking at the types of buildings we want to work on, and starting to become more selective about the types of projects we take on," Kerry adds. "We may have only 10 years of designing left, so we are refocussing our efforts on areas where we feel we can make a positive contribution."

Their recently completed student housing at the University of New South Wales – a commission also won in design competition – is one of only a few major projects the couple have realised in their adopted city of Sydney. "A lot of the time, projects in Sydney don't end up being built," Kerry says. "The client quite often on-sells the site. In our experience, that's not such an issue in Queensland, where we had more 'end-user' clients."

The prolonged gestation of Sydney projects goes some way to explaining why the Clare's largest and most impressive project to date – Brisbane's Gallery of Modern Art (GoMA, 2006) – is in their hometown, even though the architects were firmly ensconced in Sydney when they won the international design competition in collaboration with James Jones in 2001.

A tour of GoMA reveals that the principles the Clares honed while designing beautiful but modestly sized houses translate just as well to a 25,000m^2 gallery. The loose-fit plan allows curators to easily reconfigure gallery spaces, store art works in hidden panels between the walls, and work behind the scenes without being observed by the public. This "thin plan" means that visitors are never far from external terraces, observation decks and cafes and restaurants which energise the edges, and from where large expanses of glazing provide gob-smacking views of the Brisbane River and city skyline.

The building responds to its climate with a light and fine cantilevered steel roof comprising 10,000m^2 of LYSAGHT KLIP-LOK® 700 HI-STRENGTH® profile made from ZINCALUME® steel which is supported by 22 metre-high steel columns that tie it against wind uplift. The facades feature floating fins that protect against rain, light and heat, while providing a metaphorical veranda along the riverbank. All four facades are treated differently, according to their orientation, and are activated by shutters, screens, awnings and blinds, resulting in naturally lit internal circulation spaces.

At every turn, visitors are reminded that this building could only be in Queensland, specifically in Brisbane: the art on the walls competes not with "look-at-me" architecture, but with views of the surrounding city, while the building sits quietly in the background, making it all possible.

Describing their design philosophy at the Gold Medal presentation, held at GoMA in March 2010, Lindsay quoted Swedish architect Erik Gunnar Asplund, who said in 1916 that, in architecture, "It is more important to follow the style of the place than that of the time".

Throughout their careers, the Clares have striven to contribute to a definition of cultural identity – particularly in their home state – with a series of buildings that are appropriate, economical, sustainable and responsive. Queensland Premier Anna Bligh recognised the Clares' significant contribution in the revitalisation of the Southbank cultural precinct, a process she described as having a "transformative effect on our civic heart". Premier Bligh said that GoMA "is a building that welcomes, enlightens, shelters and nurtures the diverse cross-section of society that comes to see modern and contemporary art on display".

As the most readily accessible of the Clares' built works, the Gallery provides visitors with the best opportunity to experience their lightness of touch, but it is typical of all of their projects – large and small, in cities and regional locations, for public clients and private users – in that it embodies a sense of belonging. Theirs is truly an architecture that has the capacity to make people feel more at home in the world.

Lindsay and Kerry Clare are now operating as an independent design studio advising, on specific projects, and, completing selected projects in the future. SP


RICHARD STRINGER


JOHN GOLLINGS


JOHN GOLLINGS

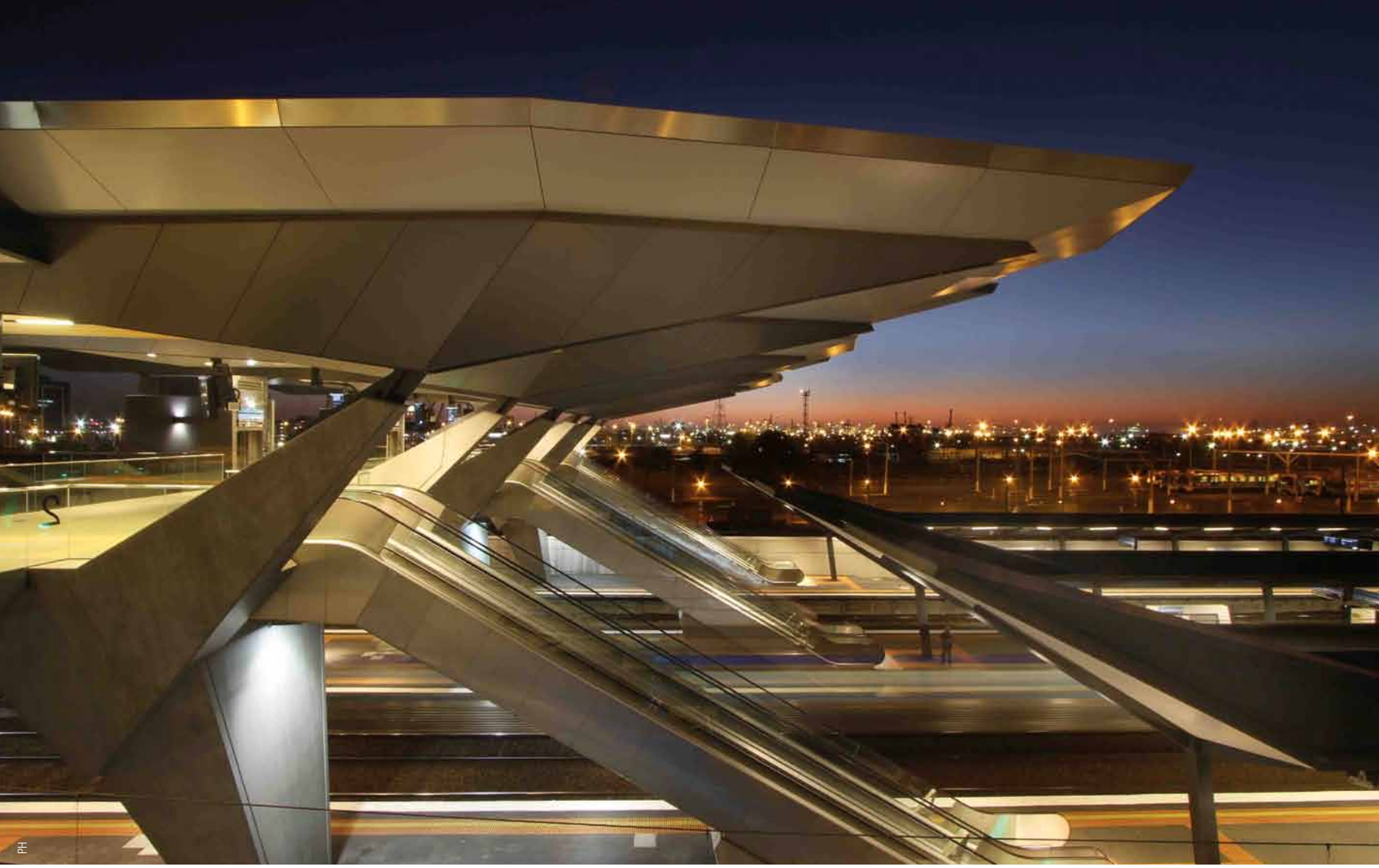

JOHN GOLLINGS

RAIL RENAISSANCE

Presented with unremarkable "bones" on a difficult site, Cox Architects has delivered a sublime surprise with North Melbourne Railway Station, revealing a lucid interplay of forms to create a memorable new face for Victorian public transport.

Words **Peter Hyatt** Photography **Peter Hyatt; Dianna Snape**

ARCHITECT Cox Architects and Planners
PROJECT North Melbourne Station
LOCATION North Melbourne, Victoria



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Tucked away on the city's north-western CBD fringe, the station deserves to be the new pin-up for Melbourne's rail operations. Lightweight, slender steelwork flows across the site as a sequence of platforms for viewing, arrival and departure. Parasol roofs and sharp functionality deliver a signature of scale and fully human spaces.

Until recently, Melbourne's Southern Cross Station was the city's transport showcase and icon for postcards. Now there is a most worthy rival, just one stop away at North Melbourne. Sited on the edge of a high-density residential and light industrial zone, the revamped station turns the clock back to a time when art and craft produced some of the grandest civic architecture.

Cox Architects' Melbourne principal Patrick Ness says the project presents an opportunity to return some prestige to public transport commuters. "Of course you consider the great history of railway stations," he says. "You want to add to that tradition yet remain modern."

Ness reveres New York's Grand Central Station. "It's a favourite," he says. "It celebrates and honours the city. Not many buildings in the public realm manage that."

Interestingly, North Melbourne station has arrived without any of the hoopla or anticipation of Southern Cross. In many ways this is a better situation for the architect and project team: it means that the pressure of public expectation is considerably reduced. And this unobtrusive quality – of sliding through almost unnoticed – helps make this project such a delightful surprise.

The station's reinvigoration includes a new forecourt and entry building, which creates a new street address. It gives way to an elevated public concourse including lifts and escalators, and upgraded platform areas with canopies, passenger seating and weather protection screens. There's also improved and quicker access within a safer and more secure environment.

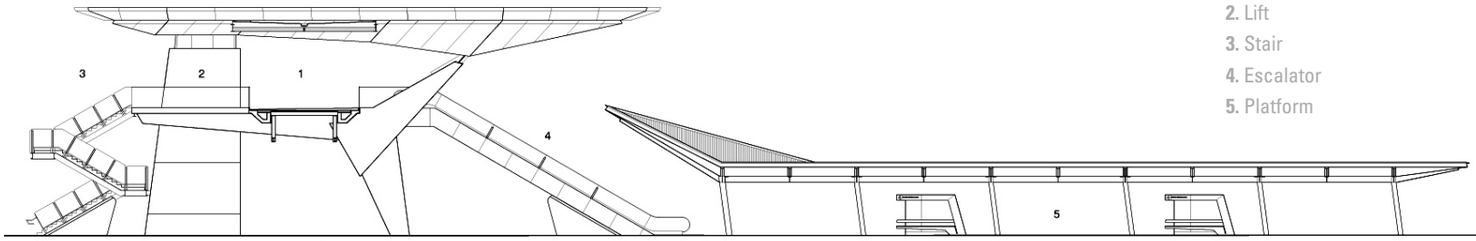
The legibility of passenger movements through the station is acknowledged through the arrangement of primary station components, including the integration of signage and information systems into the building fabric, and material selection for areas that require passive surveillance.

"Such projects are created not through idiosyncratic design, but thoughtful process," says Cox project architect Jonathan Gardiner. "It's possible to create something grand without being an edifice. It's much subtler than that. If it's iconic, that's because we work hard on the processes to ensure all critical areas for the client and public are met. We never set out to create arbitrary, or wilful, forms. This was an opportunity to echo those great railway stations of the past. As architects we wanted to continue a tradition that contributes to the public realm and honours the commuter."

One of the most obvious manifestations of that intent is the generous, elevated concourse that proves Melbourne's often maligned "flat" topography is a furphy. The concourse presents the city in a new light, offering the kinds of views that are normally the privilege of multi-million dollar apartments and mansions in the city's dress circle.

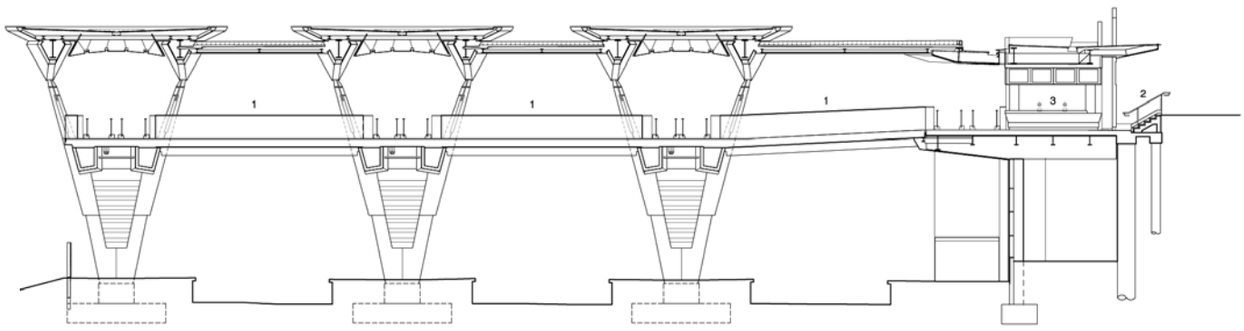
ABOVE: Despite its sculptural muscularity, the station achieves a high level of slenderness and transparency

RIGHT: Overlapping roof canopies provide a lightweight cover and visual linkages that reinforce the clarity of passenger circulation



LEGEND
1. Public concourse
2. Lift
3. Stair
4. Escalator
5. Platform

CONCOURSE SHORT SECTION



LEGEND
1. Station concourse
2. Station entry
3. Ticketing office

CONCOURSE LONG SECTION

DS

"We never set out to create arbitrary, or wilful, forms. This was an opportunity to echo those great railway stations of the past"

Even if only a transitory experience, there is a generously egalitarian quality at the station, where commuters experience this previously unrealised vista.

"For the first time there is this elevated platform that becomes a virtual plateau from which to gain a whole new appreciation of the city," says Ness. The old station had no such thing – just a series of asphalted ramps on a north and south axis in parallel with rail tracks.

In contrast to Southern Cross – which is essentially a single, stand-alone entity, North Melbourne already has expansion plans in mind to respond to the emerging Docklands precinct. As an important hub in the State Government's transport plans for Melbourne 2030 – it links electrified city/suburban rail together with diesel engine rural services. The station is also serviced by regular and expanding bus services, including those connecting with Melbourne University, which have helped it attract rapid increases in rail patronage. Additional components can be accommodated to cater for future growth, from the current 11,500 passengers per day.

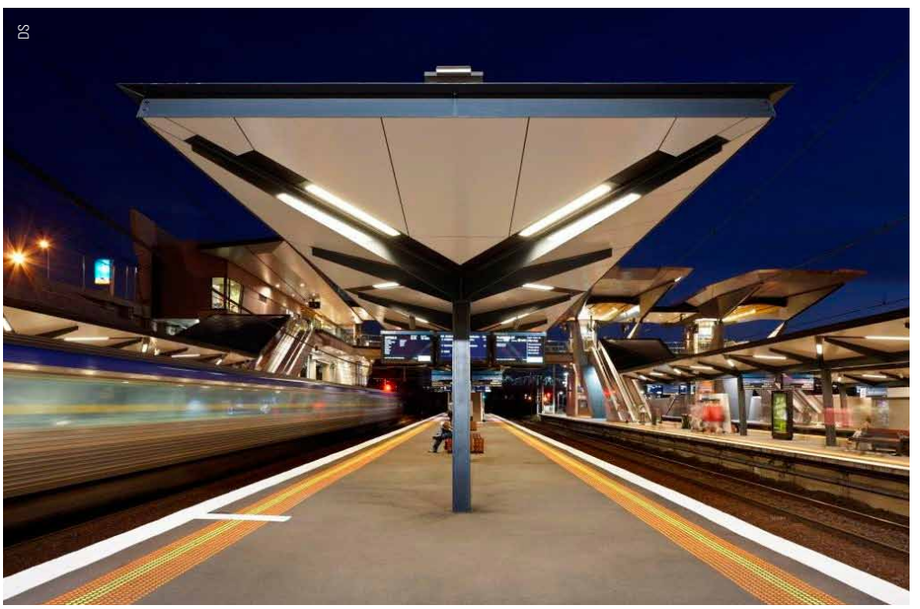
With public safety now a major factor in station design, the main ticketing booth is directly in line with the waiting room and main upper-level concourse and lower-level platforms. The combination of glass balustrades and escalators that access open platforms, which feature high levels of sun-shade and rain shelter, provides a high level of surveillance and transparency throughout the entire project.

Patrick Ness sees ugly, cold buildings as their own worst enemy. "There is a chance," he says, "that imaginative and considerate buildings are less likely to attract damage."

One of the key design challenges, Ness says, involved telescoping services and functions onto the existing narrow rail platforms. "The solution was really driven by micro function," he says. "Rail platforms provided a very narrow working corridor and are well below current standard codes. Vertical structure, lifts and escalators were designed very carefully and installed to maximise public space.

"Our work is founded in truthful expression," says Ness. "Steel is integral to that and has always informed our work. We never adjust our buildings to become an image. We don't generate filmic qualities by saying we need drama or eccentricities."

"Our work is founded in truthful expression; steel is integral to that and has always informed our work"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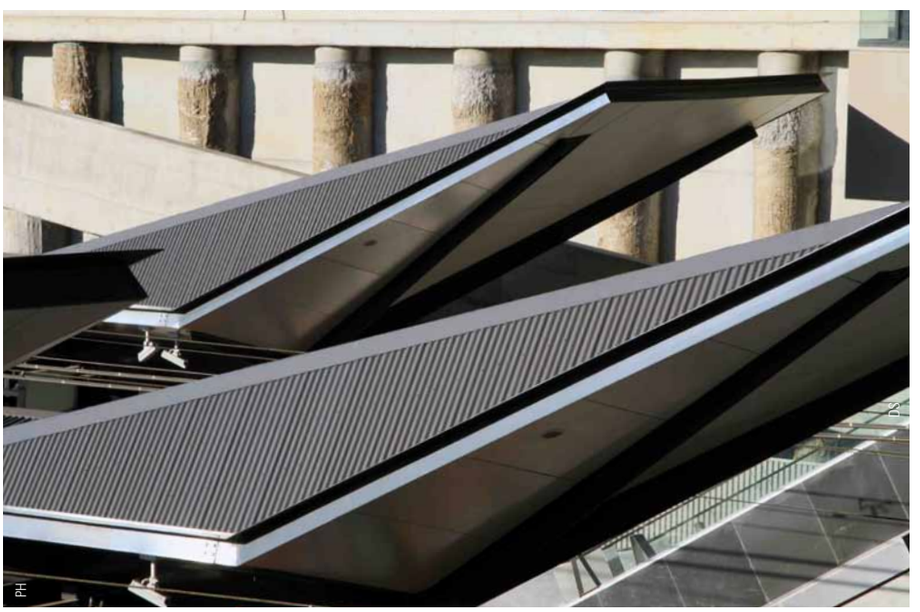
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OPPOSITE: Forms are clearly contemporary yet the lineage of Victorian platform shelters is evident to provide a convincing authenticity

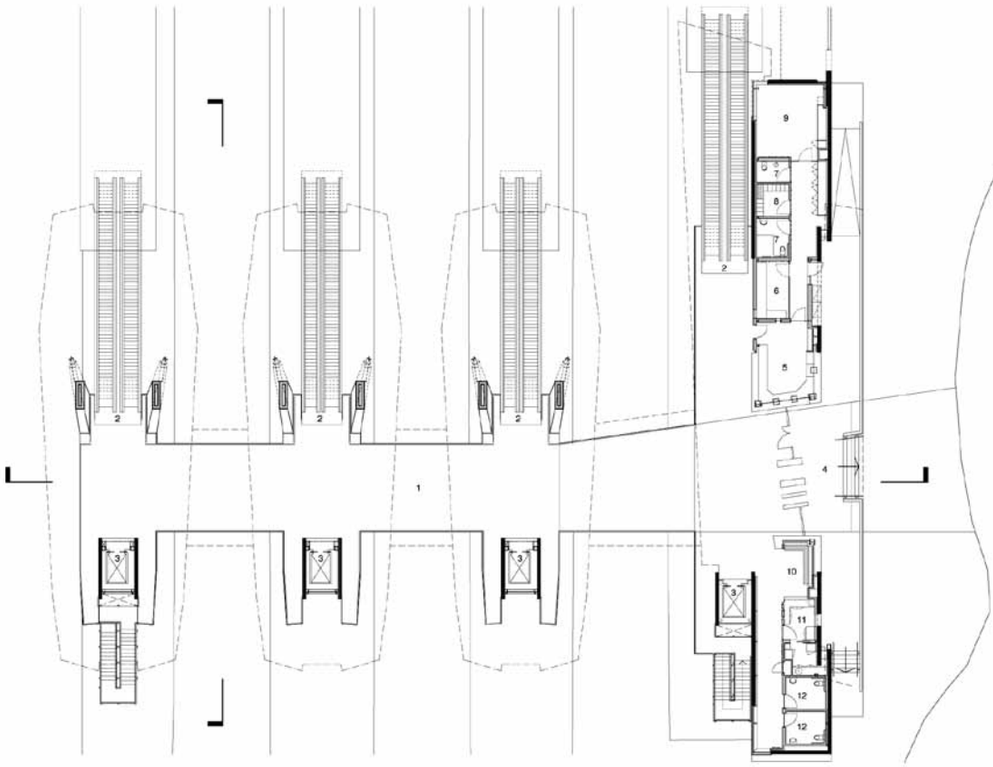
LEFT: Folded steel roofs contribute to the understated material palette that provides its visual blast less by colour or wilful form than clear, logical articulation

The main street entry elevation reveals little of the 'interior' dynamics of heroic structure, stretched escalators and sculptural finesse

PH

PANEL SAYS

If ever we saw a project that made us want to catch a train, it was this one. Prior to our discussions, one of our panellists inadvertently alighted at North Melbourne Station and was so enchanted by the new structure that he lingered to inspect it more closely, instead of departing on the next available service. If all stations were so seductive, sustainable public transport might not be such a hard sell. We are particularly fond of the sense of movement embodied in the new roof canopies – which subtly references the constant passage of trains to and from the platforms below – and we love the beautiful steel detailing, especially the gentle tilt of the steel columns at platform level. There is a clear understanding of the qualities, cleanliness and clarity of steel in architectural design.



PLAN

LEGEND

1. Station concourse
2. Escalator
3. Lift
4. Station entry
5. Ticketing office
6. Station master's office
7. Staff WC
8. Staff lockers
9. Staff meals room
10. Public waiting area
11. Kiosk
12. Passenger WC

North Melbourne Station is a declaration of a new confidence and optimism. It demonstrates architecture can improve our experience of place

Rather, a series of slender, tree-like concrete columns rise from the station's southern end at platform level to support the upper-level concourse, risers and canopies. This feathering of form and structure is critical to the achievement of design and operational clarity.

Adam Hannon of Cox says steel provided vital clues for the contemporary interpretation. "The historic link with steel provided a vital reference – the original Victorian-era station canopies remain intact on the northern end. But there was never any consideration of repeating those. The use of LYSAGHT KLIP-LOK® HS700 and LYSAGHT SPANDEK®, both made from COLORBOND® steel in the colour Ironstone®, express the evolution of materials that have stood the test of time.

"Key expressive elements such as the steel canopies ensure a high level of refinement and authenticity," adds Ness. "Steel also provided precision and economy. It would have been impossible in any other material because off-site fabrication permitted intact structural elements. All canopies were craned and skated into position while the station remained electrically alive and open as a fully working operation."

Ness regards the revamped station as an important milestone in public transport architecture. He says that after decades of neglect there is the realisation that "we can be much better". North Melbourne Station "is a declaration of this new confidence and optimism," he says. "It demonstrates architecture can improve our experience of place."

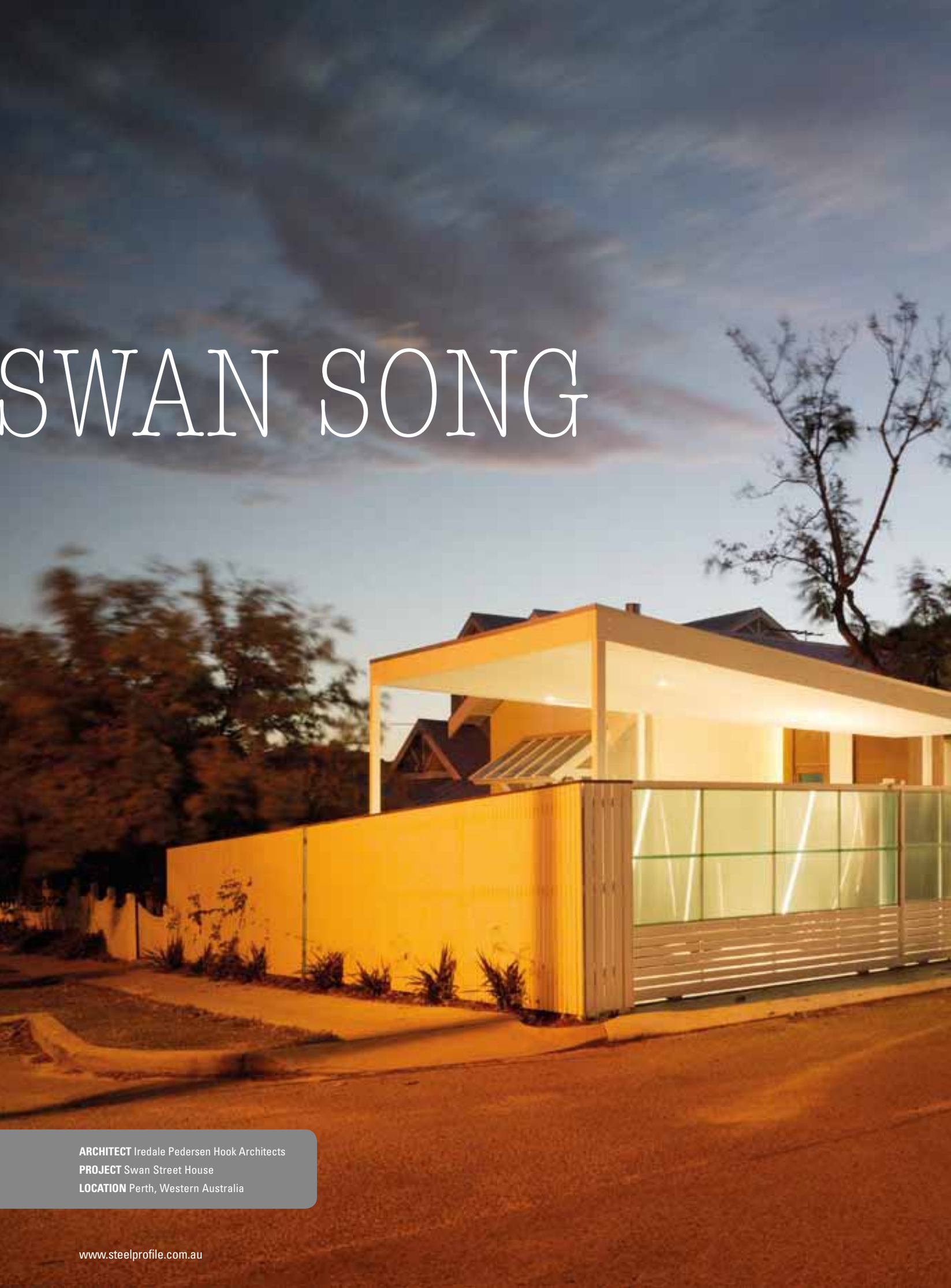
The project's arrival, with almost no fanfare, delivers commuters an outstanding surprise. In the process it forges a definitive vision of transportation modernity. Even standing still it appears to be going places. Now, if only architects designed trains… SP

The tapered roof and soffits provide bird's-wing eye for detail rather than blunt edges. The sky-bridge connects with a light, lofty aesthetic

PH

PROJECT North Melbourne Station **CLIENT** Department of Transport **ARCHITECT** Cox Architects and Planners **PROJECT MANAGER** Connex **PROJECT TEAM** Jonathan Gardiner, Patrick Ness, Adam Hannon, Troy Thirlwell, Soren Fischer, Line Rahbek, Gary Hart, James Stewart, John Lucy, Dominique Ng, Stuart Harper, Hideto Hjiwa **CONSULTANT TEAM** Structural, electrical, mechanical and hydraulic consultant, Arup; Cost consultant, WT Partnership; Building surveyor, Gardiner Group **BUILDER** McConnell Dowell Constructors (Aust) **PRINCIPAL STEEL COMPONENTS** Roof Sheeting: LYSAGHT KLIP-LOK HS700® and LYSAGHT SPANDEK®, both made from COLORBOND® steel in the colour Ironstone®; Steel fencing: LYSAGHT SPANDEK® made from COLORBOND® steel in the colour Dune®; Structural steel beams **COMPLETION DATE** November 2009 **PROJECT SIZE** 830m² (gross floor area) **TOTAL PROJECT COST** $39 million

SWAN SONG



ARCHITECT Iredale Pedersen Hook Architects
PROJECT Swan Street House
LOCATION Perth, Western Australia

An arresting addition to a suburban Perth house sits comfortably alongside its neighbours, thanks to Adrian Iredale's "archaeological" approach and sympathetic material selection.

Words **Rachael Bernstone** Photography **Peter Bennetts**

25

After reconnecting with some old school friends at a reunion, architect Adrian Iredale of Iredale Pedersen Hook embarked on a renovation project that would take on a special significance. In the course of the build, he realised it might be his last alteration and addition job, bookending more than 30 renovations undertaken in his first 10 years of practice.

The Swan Street House typifies Iredale's "archaeological" approach to renovations, where he aims to "understand the existing building and find something to respond to". The 1930s cottage occupies a corner block in a suburban street, where corrugated iron roofs outnumber their tile counterparts by 2:1. Iredale's clients – who had lived in Sweden before returning to Perth and having children – wanted to extend the small house to better cater for their growing family.

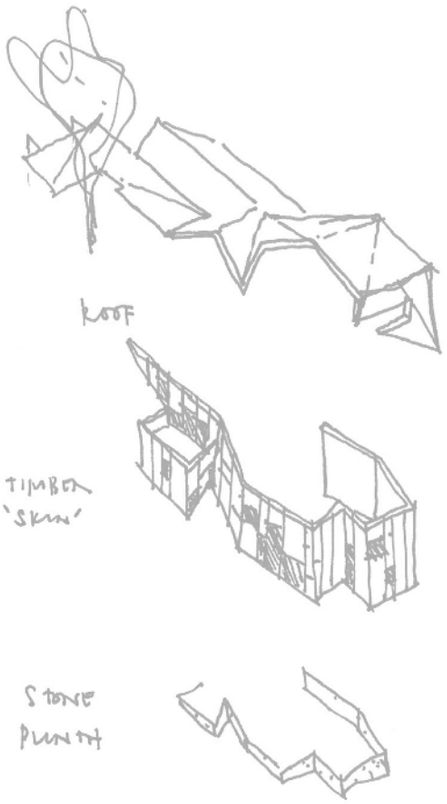
"We spoke a lot about Scandinavian architecture and its intimacy with nature, as opposed to minimalism and modernism," Iredale explains. "The clients had two children, with a third born during the building phase, so they wanted a home that engaged with the external world and landscape, incorporating materials that were soft and warm."

Drawing on his experience of designing renovations, Iredale presented several schemes to the clients before they settled on the eventual solution. "Every time we've renovated a 1930s house, the original structure has usually been a straightforward layout with four rooms at the front, a low quality kitchen and bathroom, and then parts have been filled in," he explains. "In this case, the front porch had been turned into a study and the sleep-out had been extended into the living space, with the addition of a dining pavilion at the rear.

"Often, those additions have to come off because they compromise the best use of the site," Iredale says. "In this case, the dining pavilion sat where we thought the north courtyard should go, so that we could stretch the building to protect it from the Fremantle Doctor winds, which render most outdoor spaces un-useable in the summer."

Iredale stripped the house back to its original plan before adding a second storey, and, somewhat surprisingly, he says, he opted to place most of the new additions in similar positions to the earlier "fill-ins". The carport occupied an area of the site that wouldn't have been allowed under current council bylaws, so it was retained and reconstructed, and the study was redesigned and rebuilt as a storeroom beside the front door.

The new structure may appear confronting at first glance – with its folding LYSAGHT CUSTOM ORB® profile roof made from ZINCALUME® steel, that starts at the carport, then rises over the single and double storey sections before folding down to become the western wall – but it was derived from the suburban context, Iredale says. "We wanted to introduce a two-storey building that responded to the pitched roof language of the surrounding houses, many of which have steel roofs, and it was important to tie the new section to the older part, so the roof appears to be extruded and folded out of the original house.



"The roof became the most important element of the design because the interior spaces are all about experiencing that external folded form"

"The roof became the most important element of the design," Iredale continues, "because the interior spaces are all about experiencing that external folded form."

The unusual roof produced some tricky spaces inside, Iredale admits. "In the study, which looks back on to the junction where the old roof folds down and the new roof pitches up, we positioned the desk in the vanishing point, while in the guest bedroom/home theatre, we folded the floor up to create tiered seating which is softened with cushions."

Rather than complicating the approval process, Iredale says the LYSAGHT CUSTOM ORB® roof made from ZINCALUME® steel was perceived as a positive addition to the streetscape. "It was clear to council that we were trying to find a contemporary solution that was drawn from the existing house and derivative of its context, instead of an out-of-place McMansion," he says, "so it was welcomed as a unique approach to dealing with old stock to create a decent-sized family home."

Many of his previous renovation projects share similar design responses, such as the podium base capped by a steel roof that "pulls everything together". "The first one, the Reynolds Residence – which won the WA Australian Institute of Architects' COLORBOND® Steel Award in 2002 – was a similarly dynamic structure, although it featured a more fluid language, where the bull-nose veranda and stretched lean-to dominated the form," Iredale says.

"Swan Street is different: the folding language has a certain quality of compression, expansion and release, which produce spaces that are more intimate, where the subtlety of the folds responds to decreases in scale."

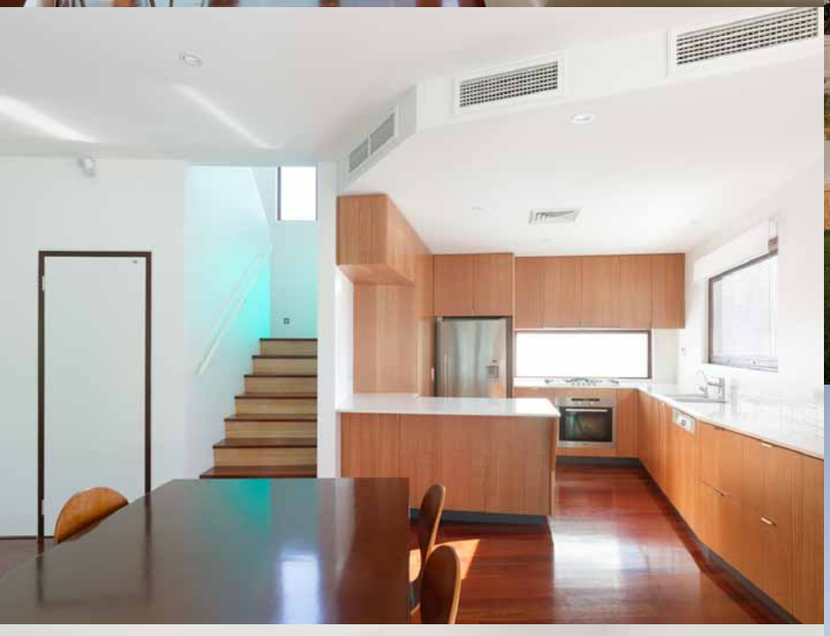
The folding steel roof performs other functions too: on the western elevation it is pulled down to act as a parasol wall made from lightweight steel. "We've invested in parasol roof forms to heavily reduce the heat load, especially in some of our desert projects," Iredale says. "Here, the western sun is excluded from the bedroom and ensuite by the parasol wall, which allows the south-westerly wind to filter through for ventilation, and also provides privacy and shading to the lower level."

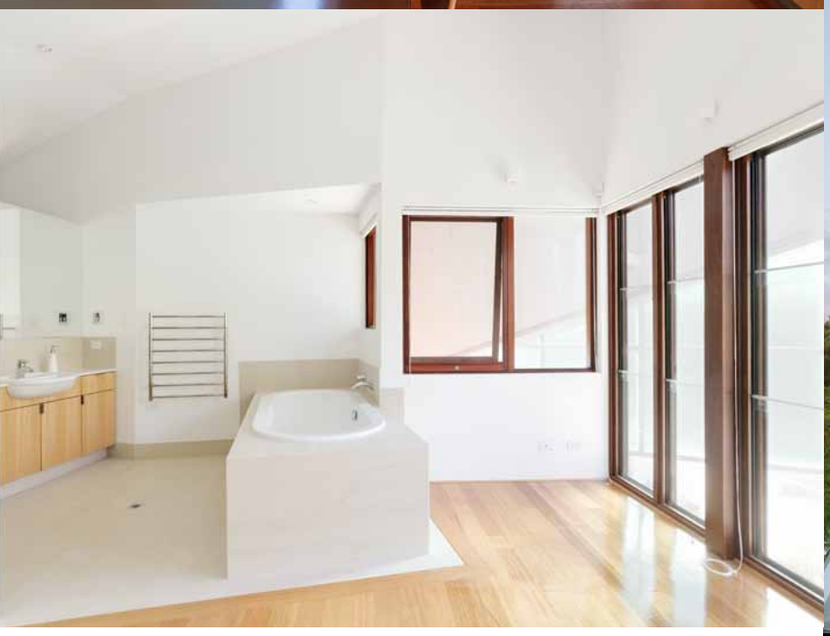
For all its complexity and high visual impact, the folding steel roof didn't overly complicate the building process, Iredale says. "We don't tender many of our projects, so the builder is introduced at the sketch design stage," he says. "The builder and I started discussions about preferred methodologies for building in the design documentation stage, in conjunction with the engineer."

It was obvious from the outset that the roof could only be built in steel. "The Swan Street house has a tension between the floor plan and the skin, because the inner part is orthogonal and the perimeter edges are folded, so the spatial dynamic shifts in every room: no two spaces share a simple geometry," Iredale says. "We needed a steel product to achieve that complexity in an economical way.

NORTH ELEVATION

The new roof made from ZINCALUME® steel was inspired by its suburban context, but Pedersen's folding forms give this house a unique presence





LEFT (TOP TO BOTTOM): The dynamic roofline creates irregular shaped interiors with quirky features, such as the study/play niche off the living area (top); the tapering kitchen joinery (middle); and the vaulted ceiling of the ensuite bathroom (bottom)

RIGHT (TOP AND BOTTOM): Iredale's folding forms are most apparent from the rear garden (top) where roof becomes western wall, and at the junction of the home's old and new sections (bottom)

PANEL SAYS

Stretching like a carefully folded ribbon – over carport, existing house, two-storey addition, and western wall – the roof made from ZINCALUME® steel unifies the various elements of this innovative renovation. As well as tying the whole project together, and embedding it within the surrounding neighbourhood, the pitches and folds of the roof create unique spaces inside. The architect has exploited these, and employed several other nuanced design strategies, to inject warmth and playfulness in what presents as a welcoming family home.

"Steel wasn't an indulgence in terms of the budget," he continues. "It's the most affordable roofing and walling material available, but it enables us to achieve complex forms. We like to use traditional materials that are appropriate contextually, and that are known materials for tradespeople to work with, but we use them in extraordinary ways."

Working with a familiar team that has built up collective knowledge on previous projects helped too, Iredale says. "I first did a project with these roofers 10 years ago, and I sat on-site with them and the builders to talk about ways of doing things, and to work out ways of building our designs with their help: it's a collaborative process," he says. "In the Dunedin Street renovation in 2004, for example, we explored a folding section with a static plan, but this project takes it one step further with folding-in plan and section, which is a first."

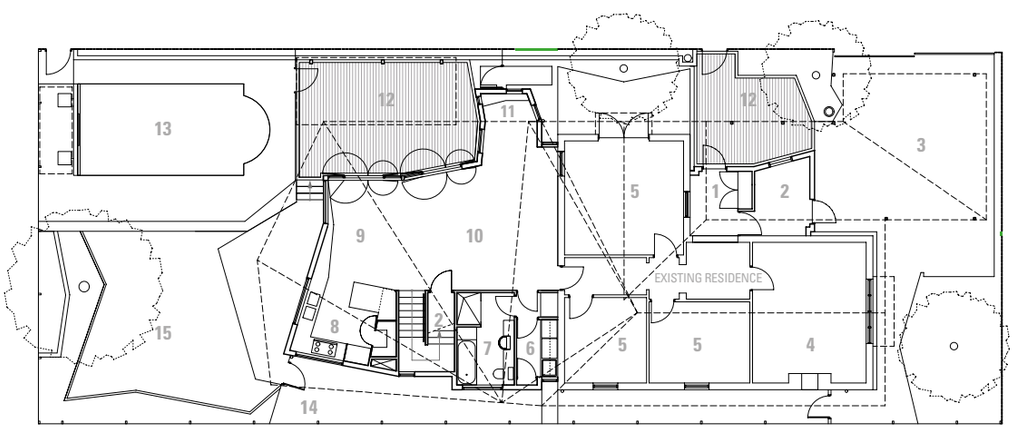
Aside from the complex roof, the remainder of the build was relatively straightforward, comprising a structural steel frame, in-filled with reverse brick veneer walls and clad externally with plywood. "We opted for dark stained plywood walls following our research into old houses in Peppermint Grove and Mosman Park, which revealed a quality of craftsmanship in the use of timber in carpentry and joinery," Iredale explains. "The plywood also ties the house back to the forested landscapes our clients had experienced in Scandinavia, and gives a sense of being in holiday cabin."

That forest-like atmosphere is intensified by the strategic placement of green-tinged Danpalon Multicell, which alters the quality of the light. "At night, that green light is emitted back to the street, which references other houses in the area that feature leadlight glass above their doors," Iredale says.

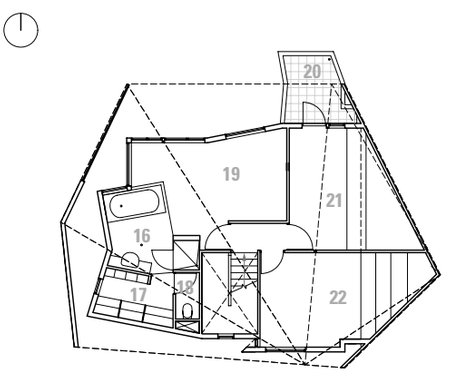
Like archaeology, which relies on careful digging to slowly peel back layers of the past, this project was painstaking at times. "It took me 1300 hours from start to finish, and the nature of our practice now means that it is difficult for me to maintain that time commitment," Iredale says. "We tend to work on new housing and other building types that can be shared easily with my colleagues, whereas the intensity of what's required to complete a renovation – both in the knowledge of the existing house and the brief – can't always be easily passed on to other people."

As his renovation swan song, this job produced handsome rewards: Iredale built an enduring friendship with his school friends, and they enjoy living in their dream home. "They wanted it to be relaxed and engaged with the landscape, the sort of house where they could make a mess without feeling like it upset the architecture," he laughs. "It's a forceful project but there is a lot of room to interpret how to use the spaces." SP

"Steel wasn't an indulgence in terms of the budget; it's the most affordable roofing and walling material available, but it enables us to achieve complex forms"



GROUND FLOOR



FIRST FLOOR

LEGEND

1. Entry
2. Store
3. Carport
4. Lounge
5. Bedroom
6. Laundry
7. Bathroom
8. Kitchen
9. Dining
10. Living
11. Play Area/ Desk
12. Deck
13. Existing Pool
14. Drying Court
15. Grass
16. Ensuite
17. Walk-in-wardrobe
18. WC
19. Master bedroom
20. Deck
21. Study
22. Theatre/Bedroom

PROJECT Swan Street House **CLIENT** Michael and Nicole Jacobsen **ARCHITECT** Iredale Pedersen Hook Architects **PROJECT TEAM** Adrian Iredale, Finn Pedersen, Martyn Hook, David Barr, Rhys Jenkins, Chris Cuellar **STRUCTURAL ENGINEER** Bill Butler Engineer **BUILDER** The Period Building Company – Ian Whittle **STEEL FABRICATOR** South Coast Welding **SHOP DRAWING CONTRACTOR** South Coast Welding **CLADDING CONTRACTOR** Bomaderry Sheet Metal **LANDSCAPE** Crispy Edges **PRINCIPAL STEEL COMPONENTS** Roofing and cladding: LYSAGHT CUSTOM ORB® profile made from ZINCALUME® steel; flashings, capping, gutters and downpipes made from ZINCALUME® steel **COMPLETION DATE** April 2008 **AWARDS** WA Australian Institute of Architects Awards 2009: Residential Architecture, Alterations and Additions – Scoop Publishing Architecture Award; Small Project Architecture – Commendation **BUILDING SIZE** 362m²

SCHOOL OF THOUGHT

ARCHITECT Hayball
PROJECT Dandenong High School
LOCATION Dandenong, Victoria

Seven identical two-storey buildings scatter like confetti across a large site in Dandenong in what at first appears to be a casual relationship to one another. But beneath this deceptively simple design, a rich and sophisticated school strategy is revealed.

Words **Toby Horrocks** Photography **Peter Clarke**

LEFT: North-facing multilabs clad in Stramit Longspan® profile made from COLORBOND® steel in the colour Shale Grey™ create abstract volumes, without eaves or visible roof

ABOVE: The buildings frame outdoor spaces

At a glance it may appear casual, but this is no ordinary school arrangement. The identical buildings are repeated at angles no greater than 15 degrees from north. They are coloured dark and light grey, with the light grey half-turned toward the sun, creating what architect David Tweedie of Hayball calls 'super contrast'.

The design constraints were specific, and intense. The client group was complex, the stakeholders many. The masterplan and the detailed spatial arrangements of the buildings are the result of an 18-month intensive briefing and workshop process – and the resulting architecture is at the cutting edge of a new teaching and learning culture.

Dandenong High School is a large and diverse community, speaking more than 60 different languages. The 2100-strong student population came together following the amalgamation of three schools as nearby suburbs experienced shifting demographics and student numbers in the area dropped. The central Dandenong site was facing increasing demand. The solution was to close two campuses, and create a new super school at central Dandenong. This also meant that the user groups involved in the briefing were multiplied by three – three principals, three head librarians, three sports directors...

Although the architect Hayball was initially not given much briefing detail, the Victorian State Government's Department of Education and Early Childhood Development (DEECD) had a very clear idea of what it wanted to achieve. Its progressive policies found a strong advocate in Hayball, which sought through its design to manage major shifts in teaching culture and navigate the project and its participants towards a cohesive synthesis.

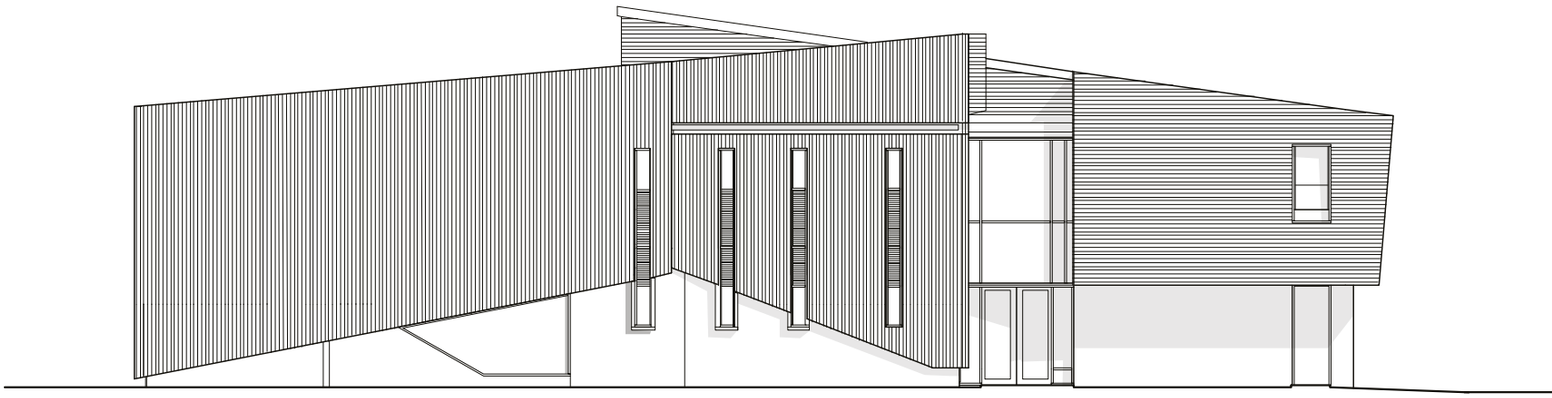
After the 18-month period of protracted briefings and workshops, a lot of pressure was building to get construction started. However, in order to get the new teaching spaces right, the School needed to trial them.

Education interior designer Mary Featherston came in as a consultant, and the School used an existing classroom to test and prototype the new spaces and teaching techniques with the students. At the same time, Hayball suggested that the builders should commence construction of the outer shells, and insert whatever interior arrangement that resulted from the prototype classroom later.

"And a big tick again to the DEECD – they supported the idea," says architect David Tweedie. He was impressed that a government department – which he realised didn't have much freedom to deviate from standard procedures, and which had to be seen to be fair to all schools and to remain publicly accountable – would support this circuit-breaking move.

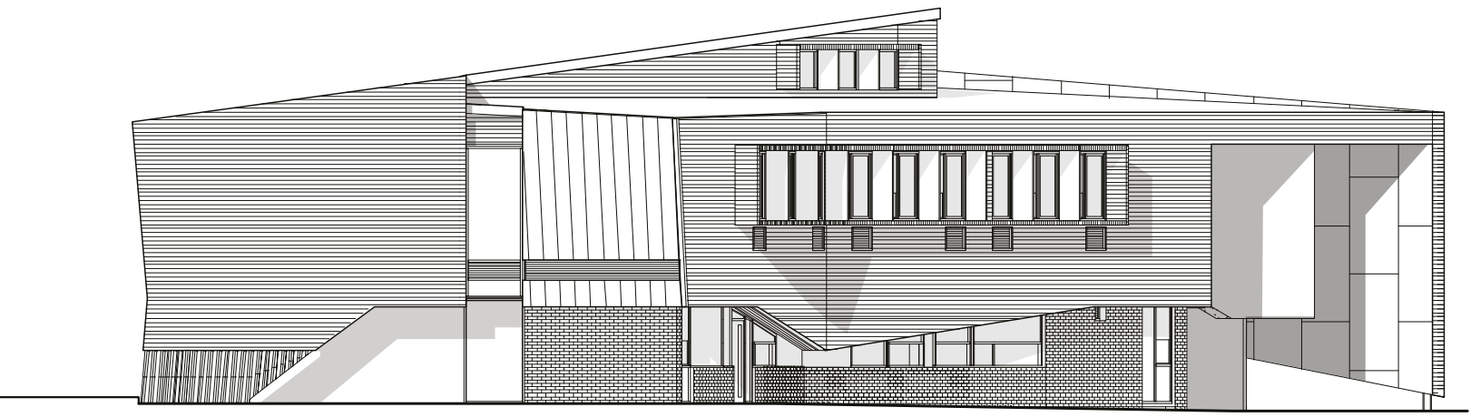
The DEECD's method of allocating funds for any new building is based on generic requirements, with both the building's total area and budget pre-set. In thinking laterally about how space is defined and categorised, Hayball's ingenuity came into play. For example, it subsumed all the 'corridor' allocation into its open plan. It was also able to scatter some 'library' space across the seven multi-use buildings.

Another pool of extra money was available for environmentally-sustainable design measures, and this is where Hayball has been particularly clever. It has designed the essential structure of each building to perform as a thermal labyrinth by using hollow pre-cast concrete planks. The architects adjusted the standard joint detail of this long-span material to draw in outside air to either pre-cool



EAST ELEVATION

"The form of each of the seven Schools Within a School (SWIS) is expressed as two strands at an acute angle to each other"



WEST ELEVATION

or pre-heat the air conditioning system, depending on the time of year. Not only did this generate flexible spaces by avoiding columns (the planks can stretch up to 16 metres unsupported), it had good acoustic properties and saved construction time. Importantly, a constant delivery of fresh air is accepted as leading to better learning outcomes in the classroom.

The form of each of the seven Schools Within a School (SWIS) is expressed as two strands at an acute angle to each other, with the central part having a pop-up roof with clerestory lighting. The ends of the strands cantilever out several meters, another advantage of the plank construction system. Stramit Longspan® made from COLORBOND® steel clads both strands, creating abstract volumes, without eaves or visible roof.

This architectural move presented a challenge because the DEECD maintenance rules ban the use of box gutters. Instead of resorting to traditional eaves gutters, Hayball came up with an intelligent detail where the roof – Stramit Speed Deck Ultra® made from COLORBOND® steel in the colours Night Sky®* and Shale Grey™ – meets the Stramit Longspan® COLORBOND® steel wall cladding. Hayball has recessed the eaves gutter into the width of the wall, and the end profile of the roof sheeting is concealed by a subtle strip of flashing.

The entry to each SWIS is emphasised by a canopy, a two-storey-high inverted 'L' clad in Stramit Longspan® profile made from COLORBOND® steel that touches the ground. This is the only point where the malleable material is put within student reach, but in such a high surveillance area, it remains undamaged.

Stramit Longspan® profile also has a grain – or a direction, like stripes in a cloth. This means wrapping a three-dimensional form in it presents its own challenges, according to Tweedie.

"I'm still in two minds about which direction we should have wrapped the ends," he says.

The 'super contrast' created by having the COLORBOND® steel in the lighter Shale Grey™ colour face the sun, and the COLORBOND® steel in the darker Night Sky®* colour face the shade, produces a striking visual effect, and the relative reflection and absorption of heat also improves thermal performance.

Tweedie suggests the detailing of the COLORBOND® steel is not overly sophisticated, but its versatility, simplicity and cost-effectiveness is incomparable.

A well thought-out educational philosophy lies behind the juxtaposition of the school buildings.

"They appear to be individual buildings just flung around, but Dandenong High School has a real view about the equality between them," explains Tweedie. In fact the relationship between each building has been carefully considered. They enclose a broad open space between the existing 20th century school buildings that were retained and the seven new ones, that Tweedie, harking back to ancient Greece, refers to as the 'agora'.

PANEL SAYS

The entry to this new school campus demonstrates an admirable clarity and connects seamlessly with the circulation spaces beyond. Internally, wide corridors boast generous windows that offer close-ups of the outdoor areas and expansive views of the surrounding landscape, further enhancing the building's sense of connectivity. These urban design planning strategies ensure that staff, students and visitors alike can easily orientate themselves on the campus, which, given that this project is part of Victoria's largest secondary education precinct, is highly pertinent. The east and west elevations are particularly inspiring, and we like the formal expression of the entire facade, especially the folding detail that manipulates scale with pleasing effects.

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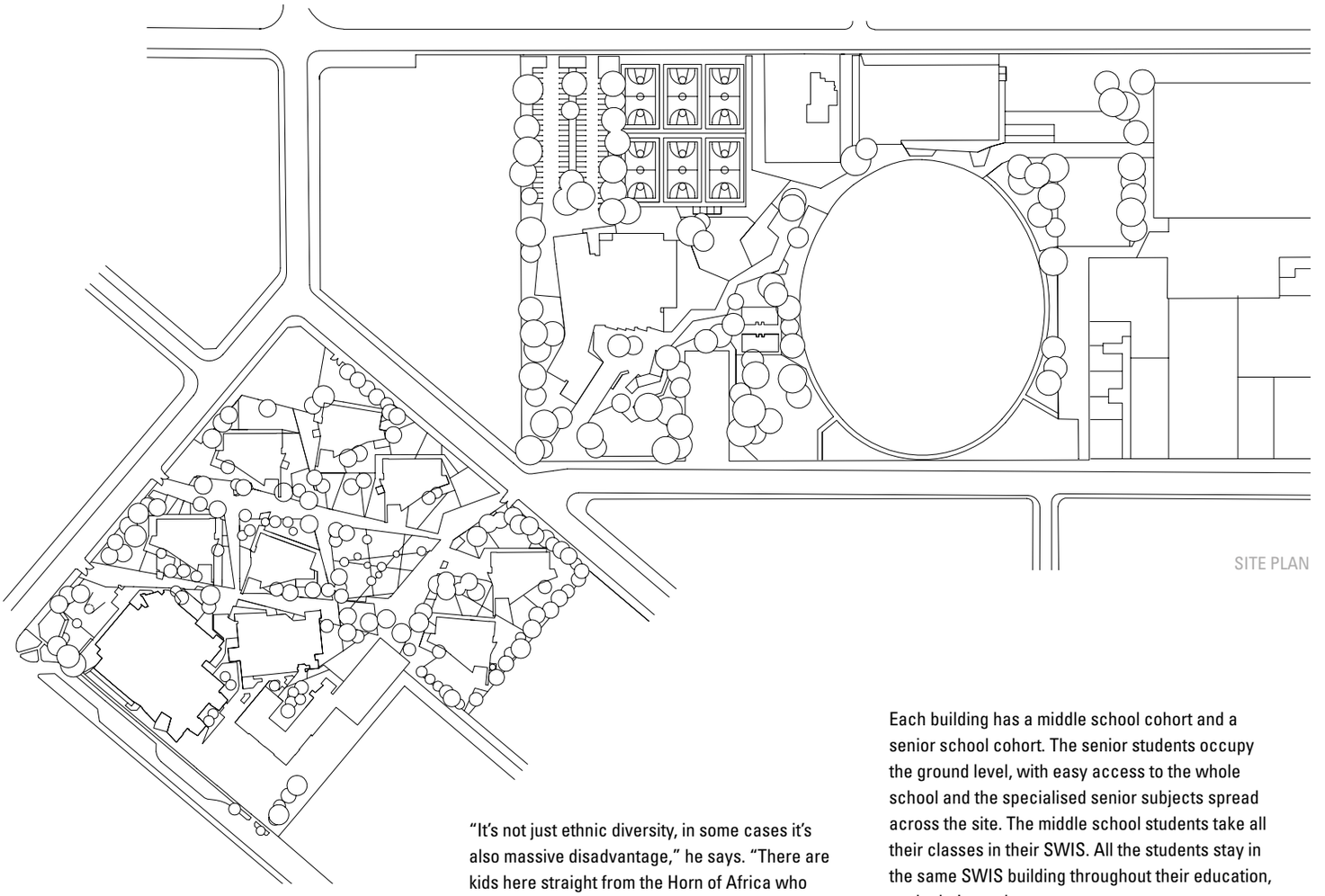
"Two thirds of the design is not the buildings, it's about the change to teaching practice"

ABOVE: Hayball's open-planned and mixed-mode spaces make ad hoc student movements a common and non-disruptive activity

LEFT: Multimedia presentation space



SITE PLAN

"Arranging these two-storey buildings was a rare opportunity to give some reasonable scale to space, to really capture outdoor space," he says. The edges are where the students congregate. A veil of deciduous trees to the north of each SWIS creates shaded outdoor teaching space. The idea was to create a diversity of spaces that could be 'owned' by the students. And the confetti of repeated buildings have matching cells of teacher surveillance, ensuring the security of the grounds.

"Two thirds of the design is not the buildings, it's about the change to teaching practice," says Tweedie. He says the principal and the two assistant principals (the principals of the three original schools) sustained their passion for their project throughout. The series of workshops with specialists from the DEECD, education consultants and Mary Featherston also helped give the staff a sense of ownership in the design.

"Some of the staff are incredibly passionate about it," enthuses Tweedie. "They tend to really support the buildings. That's been the most rewarding part."

A heavy emphasis on shared spaces and innovative teaching methods was driven in part by the school's local demographics.

"It's not just ethnic diversity, in some cases it's also massive disadvantage," he says. "There are kids here straight from the Horn of Africa who might be 14 and have a teaching age of 7."

And with so many different languages spoken at home – Tweedie talks of attending a parent-teacher night and seeing a bank of interpreters waiting in the wings – there was a strong emphasis on teaching English as a second language. This means students are constantly moving between general classes and specialist individual assistance.

Hayball's task was to design spaces that made ad hoc student movements a normal, daily activity, not stigmatised or disruptive. The evidence that Hayball's open-planned, zoned and mixed-mode spaces operate successfully in this way was our own presence, during school hours, conducting the interview for this story.

"Because we're not entering a single class space, they are ignoring us," observed Tweedie. Effectively we walked around chatting inside classrooms. We simply blended in with the general hubbub of activity.

The School's research indicated that a cohort of 150 students was the maximum size that would foster meaningful social bonds. Thus, each floor holds 150 students. Multiplied out, the seven buildings equal the 2100-strong population (the final four buildings are due to open in 2011).

Each building has a middle school cohort and a senior school cohort. The senior students occupy the ground level, with easy access to the whole school and the specialised senior subjects spread across the site. The middle school students take all their classes in their SWIS. All the students stay in the same SWIS building throughout their education, as do their teachers.

By far the most revolutionary shift in the mechanics and politics of space at this school is the relationship between students and staff. The teachers have given up their traditional privacy. We stood in the student space, and watched teachers at their "office" desks through a glass partition, observed their piles of paper and personal bric-a-brac. They are living role models for the students, who witness them working together.

During lunchtimes and recesses the kids are not just kicked out into the playground to give the teachers time out. Even the toilets are located inside the SWIS, encouraging students to spend free time indoors if they want, to do homework, use the computers. This enhances community. The transparency also performs a surveillance role, with staff constantly overseeing students. Tweedie says that not only have English literacy rates gone up, the level of discipline required has gone down.

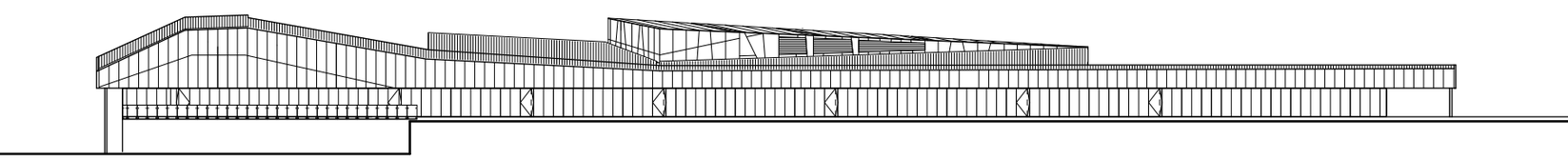
"There's more ownership and more respect," he says. **SP**

** Night Sky® is no longer part of the standard COLORBOND® steel colour range. Please talk to your nearest BlueScope Steel office regarding availability of non-standard colours for future projects.*

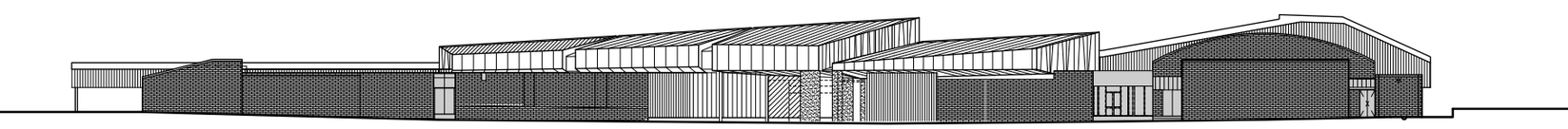
PROJECT Dandenong High School **CLIENT** Department of Education and Early Childhood Development; and Dandenong High School **ARCHITECT** Hayball **PROJECT DIRECTOR** Richard Leonard **DESIGN ARCHITECTS** David Tweedie, Eugene Chieng **PROJECT ARCHITECT** Michael Thom **STRUCTURAL & CIVIL ENGINEER** Wallbridge & Gilbert Consulting Engineers **BUILDER** Harris HMC **LANDSCAPE ARCHITECTS** Outlines Landscape Architecture **PRINCIPAL STEEL COMPONENTS** Cladding: Stramit Longspan® profile made from COLORBOND® steel in the colours Night Sky®* (southern pavilions) and Shale Grey™ (north-facing pavilions); Roofing: Stramit Speed Deck Ultra® profile made from COLORBOND® steel in the colours Night Sky®* and Shale Grey™ **PROJECT TIMEFRAME** Early 2007 to April 2008. Construction – March 2008 to April 2009 **AWARDS** 2009 Department of Education and Early Childhood Development, School Design Awards – (1) Best Overall Project and (2) Best Secondary School; 2009 Council of Educational Facility Planners International (Victoria Chapter), Winner New Construction/Major Facility **GROSS FLOOR AREA** 4,245 m² **TOTAL PROJECT COST** $10million (Stage One)

RUB OF THE GREEN

With an inspired steel roof and clever alignment of facilities, Terroir has provided a formerly generic bowling club with a bold new identity. Words **Rob Gillam** Photography **Paul Bradshaw**



EAST ELEVATION



WEST ELEVATION

ARCHITECT Terroir
PROJECT Maitland City Bowls, Sports and Recreation Club
LOCATION Rutherford, New South Wales

Suburban Rutherford, near Maitland in the New South Wales Hunter region, is an unlikely setting for what is now arguably this country's most architecturally distinguished lawn bowls club. A country town, woven in with crowds of plain cottages and speared with commercial super-centres, it is a long way from the cosmopolitan surrounds normally associated with such an accomplished building.

So it's surprising, on approach, to be greeted by Maitland City Bowls' massive yet gently-flowing form.

The club's location is not the only thing remarkable. It is noteworthy that such a bold design was chosen by the clients to accommodate an age demographic usually more associated with conservatism than architectural adventure. As design director Gerard Reinmuth acknowledges: "It's quite amazing such an ambitious project exists at all. Australian bowling clubs have typically been run by the older generation who are often more conservative in their approach to design, but from the outset the client shared our vision for what the club could become."

Reinmuth says proposing a familiar material to construct the club roof helped usher in acceptance of the building design. "The new-world design may have seemed unusual, but many of the club members have worked with steel on farms and building projects in the surrounding area and know the value and reliability of the material very well. COLORBOND® steel gave everyone confidence and that helped temper concerns over our plans to use it in our proposed fashion."

Terroir's first act was to set the extent of the roofline with a 'bumper' frontage. Constructed of LYSAGHT KLIP-LOK 700 HI-STRENGTH® profile made from COLORBOND® steel in the colour Pale Eucalypt®, it runs horizontally across the entire 90-metre eastern side and crowns the bowling greens.

In this early stage of construction, the club roof was reminiscent of a Hollywood movie set in that – when viewed from the greens – it presented an impressive facade, but just behind was the unromantic reality of the older roof, peppered with service equipment.

Project architect Chris Rogers says it was important to minimise disruptions, so Terroir staged the roof construction. "We came up with a design that was elastic enough to accommodate briefing requirements yet was still part of an integrated solution that drove the club's identity as it grew," says Rogers. "Very strong breaks in the roof and flared gutters allowed the construction to be more easily broken into different stages."

A steel substructure was carefully knitted onto the club's existing roof. "It was tricky to get the piers and columns exact because it's not until you get out the 'can opener' and start looking inside the roof that you know exactly what you're dealing with," says Rogers. "We had to do a bit of cutting and shutting

PANEL SAYS

This project first came to our attention at the conclusion of the initial stage – the dramatic new roof on the bowling green elevation – and we were impressed by the boldness of that gesture, its clever use of steel, and the craftiness of Terroir's strategic design move, but the most recent phase is so much more remarkable. We love the fact that a lacklustre-looking bowling club in a regional town has taken the audacious step of re-making itself as something daring and intriguing, to attract new members and better serve its existing clientele. As well as giving the 'bowlo' a new appearance – one that accentuates the club's forward-looking attitude – the architects have bestowed a sense of civic scale and pride.

in places to achieve the tolerances, but once the structure's geometry was set everything flowed from there.

LYSAGHT KLIP-LOK 700 HI-STRENGTH® profile made from COLORBOND® steel in the colours Pale Eucalypt® and Bushland® was chosen to enclose the 2500m^2 roof, which is broken into four distinct sections that are part of an integrated solution.

"From a technical point of view we made the decision to go with KLIP-LOK® because it can do long continuous trays, and the depth of the trays allowed us to achieve extreme cross-falls in the roof design – up to 25 degrees in some cases," Rogers says. "Coupled with this, and from an aesthetic point of view, we were most comfortable with the distance between trays in the KLIP LOK® sheets as we felt this best suited the vast scale of the roof."

The club's new roof was always destined to provide more than mere elemental protection. Terroir built upwards to create functional volumes for services such as air-conditioning and water storage to be hidden within the roof, and also to create office space for the club's staff.

Despite its monumental presence, the roof's cascading lines are largely unobtrusive, Reinmuth says, because Terroir sculpted its form to connect with the wider natural landscape. "Some quite beautiful hills are silhouetted in the distance and the slope of the roof mimics those surrounds," he explains.

There is also a dialogue between the elevated club roof and the surrounding suburban rooftops, he adds. "On a greater scale, the roof deflects the eye out to the natural landscape, yet it also has an urban context. It is less conscious, but there is a local roof-to-roof dialogue."

Having accomplished great things with the new roof, Terroir also aimed to inject new life into the heart of the club, to restore its beleaguered identity.

"Formerly, when you walked in, you could have been in any club anywhere in the country," Rogers says.

"You were in a big dark room with the noise and flashing lights of poker machines. You couldn't even see the bowling greens. To us, the club is supposed to be about bowling, not poker machines, so we saw it as a chance to change the culture and pull the club back to its essence by reconnecting the clubhouse to the greens."

The club's loading dock was moved into a basement to make way for a grand new entrance. "You used to have to enter the club asymmetrically and travel a fair distance to reach the outdoor areas, but now there is a direct channel from the entry to the greens," he adds. "This east-west central spine intersects with another north-south corridor to access the club's other key areas. "From the main axis you can see all the way through the club, from wall-to-wall," Rogers says. "It's a very natural and practical design."

Steel makes an impression beyond the club's roof, with flat sheet made from COLORBOND® steel in the colour Pale Eucalypt® being used to line the entire foyer and skylight.

"We took a familiar generic flashing material and then detailed it in a very unfamiliar way," Rogers says.

"The idea was to remind people they are standing under a steel roof – and we think that you can intuitively tell it's the same material."

In this vaulting space, the material takes on a new life. "Outside of its usual context, which can be quite prosaic, it's almost like it's no longer COLORBOND® steel but a different material altogether," Rogers says. "It has a soft, crinkly texture like leather, which gives it a quite luxurious feel. You also get a quite interesting change in colour, depending on how the light from above plays on it."

The skylight features a unique shadowing effect which is achieved by running exposed painted steel Z-purlins and UBs across the opening and above the door entry where, in another neat touch, five air conditioning jet diffusers mimic a group of bowls.

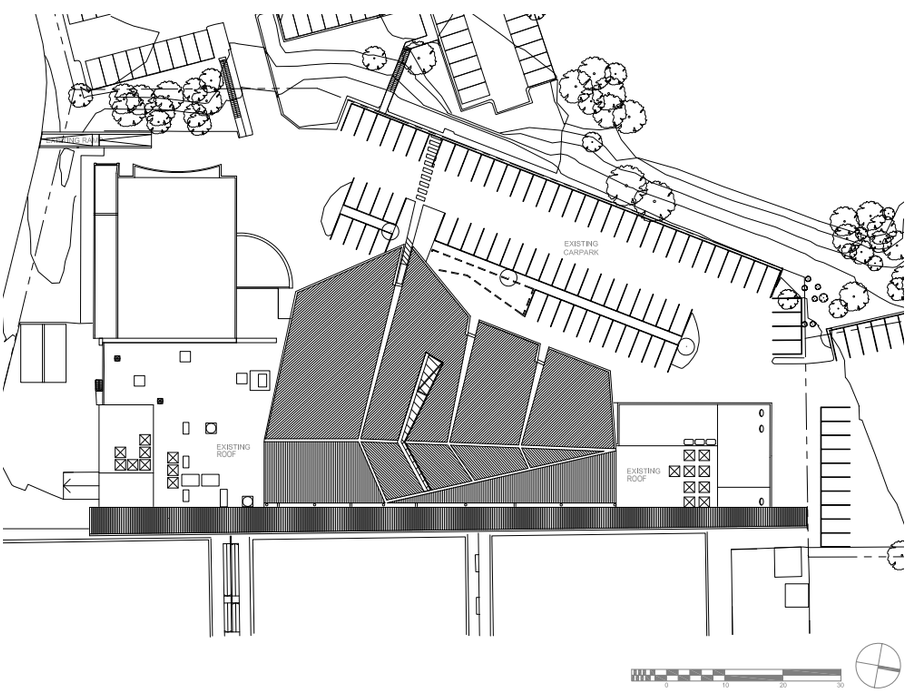
A giant 90m-long green-tinged glass facade completely transforms the club's interior. Whereas views to the greens were once blocked, they are now celebrated.

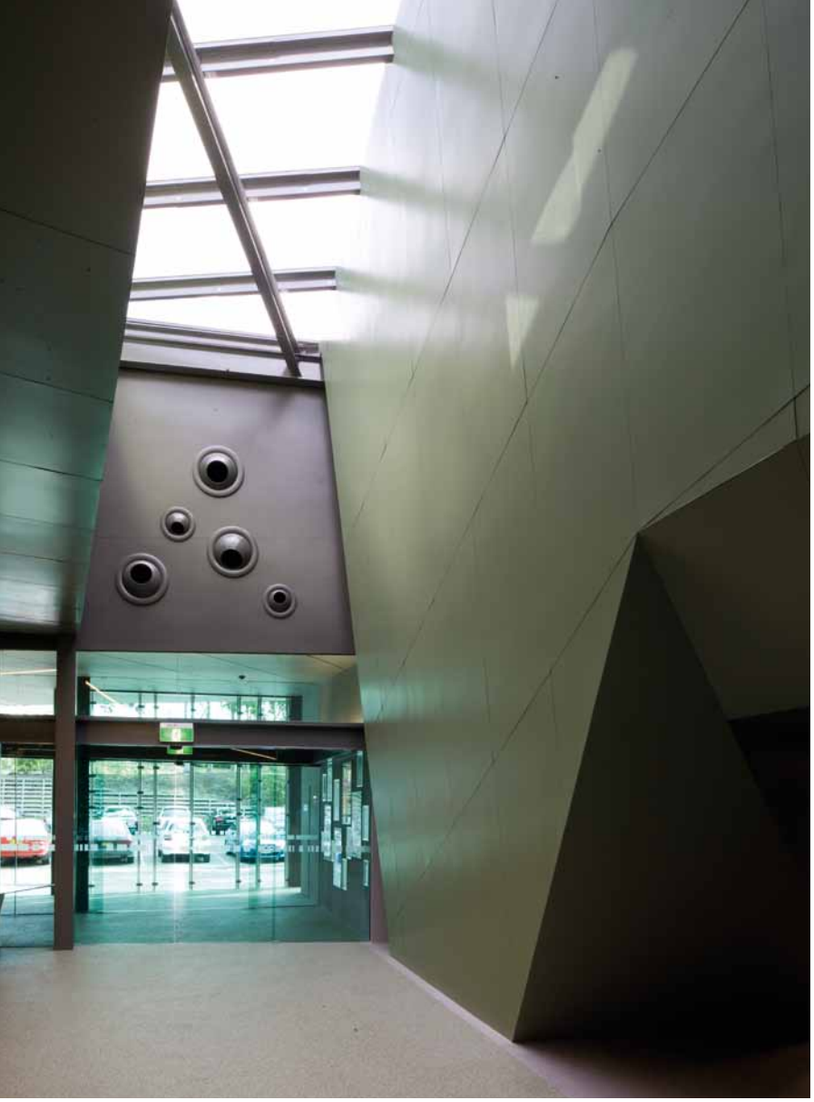
"When you walk in, you are immediately connected with them: you almost feel like you're already standing on the green," Rogers says. The sensation of being outside is subtly reinforced by the carpet, which was colour-matched with the lawns. "We took three different tufts of grass to the manufacturer," Rogers says, "and they applied them in a 'salt-and-pepper' fashion throughout the weave."

By giving the club a bold new look – which will help it attract a broader demographic than the traditional white-clad bowlers of the past – Terroir has deftly and convincingly achieved its ambitious objectives. And while the new facilities are likely to appeal to a younger crowd, there is plenty in the redesign for the bowlers too.

With the second of four stages now built, the club's master plan is slated for completion in 2015. In the meantime, Maitland City Bowls has rolled out a crackerjack, unveiling a new clubhouse that few other bowling clubs can hope to surpass. SP

"We saw it as a chance to change the culture and pull the club back to its essence by reconnecting the clubhouse to the greens"





Flat sheet made from COLORBOND® steel details the foyer and skylight. Here, it imparts a luxurious feel with almost leather-like texture. Air conditioning jet diffusers mimic a group of bowls

BRETT BOARDMAN

The club's bold and elegant roof is multipurpose in practicality and connects with the wider natural landscape, as well as conversing with the local suburban roofscape

BRETT BOARDMAN

PROJECT AND CLIENT Maitland City Bowls, Sports and Recreation Club **ARCHITECT** Terroir **PROJECT MANAGER** Haymann-Cohen **PROJECT TEAM** Gerard Reinmuth, Scott Balmforth, Richard Blythe, Allie Earl, Cassandra Kiss, Chris Rogers, Moritz Von Stuenzner, Nic Fabrizio, Samaneh Moafi, Sarah Benton, Urd Norgard-Nielsen **STRUCTURAL AND CIVIL ENGINEER** Stage 1A: TTW; Stage 1B: MPC Consulting Engineers **BUILDER** Stage 1A: Hansen Yunken; Stage 1B: Classic Group **STEEL FABRICATOR** Stage 1A: IM Engineering; Stage 1B: Industrial Maintenance & Fabrications **SHOP DRAWING CONTRACTOR** Stage 1A: WFJ Engineering Co.; Stage 1B: Centreline Drawing Services **CLADDING CONTRACTOR** Stage 1A: Innerspace; Stage 1B: JA Crockets **PRINCIPAL STEEL COMPONENTS** Roofing: LYSAGHT KLIP-LOK 700 HI-STRENGTH® profile made from COLORBOND® steel in the colours Pale Eucalypt® and Bushland®; Internal cladding: flat sheet made from COLORBOND® steel in the colour Pale Eucalypt®; Structural steel including 96 tonnes of UB, PFC, SHS, UC and Z-purlins, and flat steel plate (8mm & 12mm) **BUILDING SIZE** Roof: 2500m², Internal fit-out 600m² **TOTAL PROJECT COST** $4 million

NEW DIGS

A new youth hostel in Sydney's The Rocks features an impressive, hovering structural steel solution that connects the building with a site steeped in history.

Words **Mimi Kos** Photography **Paul Bradshaw**

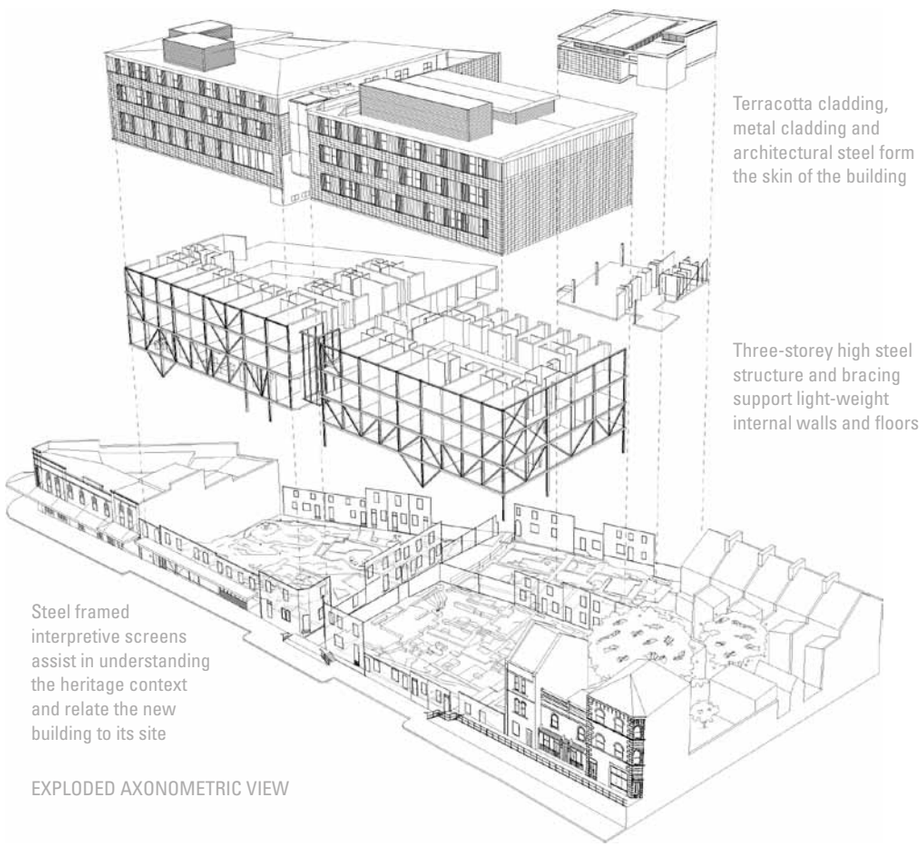
Guests at Sydney Harbour YHA are in for several treats: the hostel features Opera House views from its roof terrace and, uniquely, open atriums that give birdseye views of colonial Sydney. A three-storey steel frame allows the hostel to hover above an active archaeological site – The Big Dig Archaeology Education Centre. Steel walkways and stairs at entry level stretch out across the site and offer a close-up view of the historical remnants.

Steel was chosen for its light weight, economy and construction methodology.

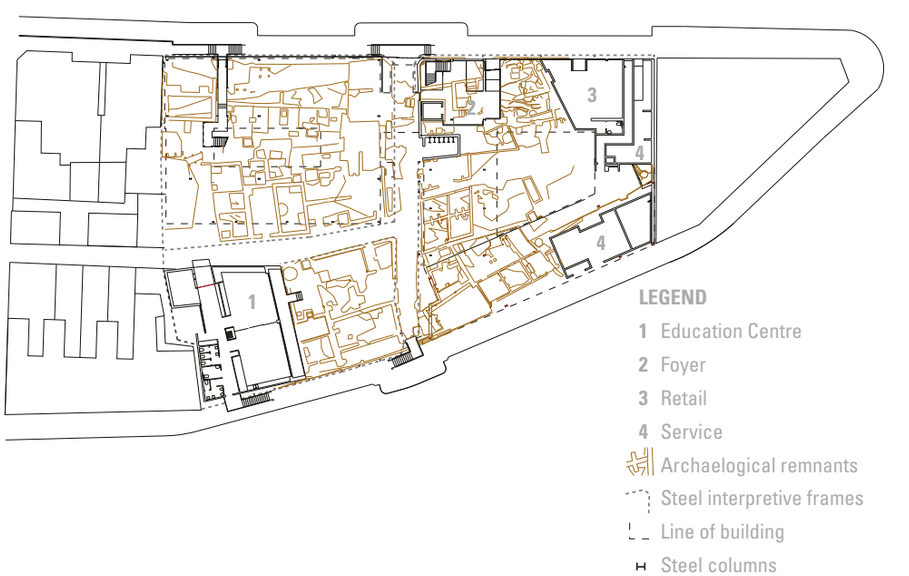
"We developed a concept of a steel-framed building where trusses would have long spans across the site, a minimal number of columns and small-sized footings," says Tzannes Associates design director Peter John Cantrill. "In the direction of the trusses, the column and footing placement could be adjusted so we could avoid any place on site that had significance."

The robust form results from a steel frame that slips discretely into a lightweight external shell, while light-gauge steel wall, floor and roof framing was specified to keep the overall weight down. The solution necessitated careful detailing of the structure within fire-proof cladding, applied continuously around the interconnected frame.

A preference for dry trades underscored the neatly exposed steel-to-precast footing detail and use of pre-finished LYSAGHT CUSTOM ORB® profile cladding made from COLORBOND® steel in the colour Surfmist®, that wraps around from soffit to wall, explains Cantrill. "We seriously limited the wet trades over the whole site and during construction."



EXPLODED AXONOMETRIC VIEW



LEGEND

1 Education Centre
2 Foyer
3 Retail
4 Service
Archaelogical remnants
Steel interpretive frames
Line of building
Steel columns

The arrangement of the trusses almost entirely within the walls posed additional design challenges. "The position of the diagonal elements in the trusses limited the location of openings such as windows and doors," Cantrill says. "There had to be a very careful consideration integrating room placement and openings within the structural framework."

Since the discovery of the colonial remains in 1994 – when the removal of a surface car park prior to redevelopment revealed remnants of houses, laneways and artifacts from the 18th century – painstaking work by archaeologists, architects and others has produced a youth hostel that offers million dollar views for its guests, while preserving the priceless relics at its feet for all to admire. SP

PROJECT Sydney Harbour YHA **CLIENT** YHA NSW **ARCHITECT** Tzannes Associates **PROJECT TEAM** Peter John Cantrill, Chi Melhem, Allison Cronin, Amanda Roberts, Lianna Stampardis, Jayne Mills **STRUCTURAL ENGINEER** Taylor Thomson Whitting **SERVICES ENGINEER** ITC Group **HERITAGE CONSULTANT** Godden Mackay Logan **BUILDER** Built NSW **PRINCIPAL STEEL PRODUCTS** Cladding, soffit, balustrade cladding: LYSAGHT CUSTOM ORB® profile made from COLORBOND® steel in the colour Surfmist®; Roofing: LYSAGHT KLIP-LOK® profile made from COLORBOND® steel in the colour Woodland Grey®; Roof framing made from LYSAGHT SUPACEES®; Wall framing made from Rondo Steel Studs; SHS, CHS, RHS, UB, UC, PFC, EA, UA, cleat plates, rods from BlueScope Steel **BUILDING SIZE** 5000m² **TOTAL PROJECT COST** $21 million

"We developed a concept of a steel-framed building where trusses would have long spans across the site, a minimal number of columns and small-sized footings"

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