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PENNY FULLER
Partner and Director of Penny Fuller Architecture. Her projects have been awarded for their creativity and design sensibility.

MATTHEW HYLAND
Principal of Sydney-based architectural firm HYLAND Architecture. His work has been widely recognised for its innovation and attention to detail.

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These unusual apartments in Perth offer a new way of living for young people, in a handsome building with cladding made from COLORBOND® steel that references the suburb’s history.

Words Alisa Taylor  Photography Robert Frith
Diversity in housing stock is a hot topic. Several recent design competitions have asked architects to invent ways to address the need for different types of housing, whether it’s in-fill in middle-ring suburbs in Sydney and Brisbane, or housing for Gen Y residents in Perth.

The state’s land and development agency ran the latter competition under its Innovation through Demonstration program in 2014, when it asked young architects to submit “An idea which encapsulated the Gen Y lifestyle and living requirements”. Participants were asked to describe a flexible, cost-effective and sustainable dwelling for the next generation of home owners.

From 21 submissions, and six semi-finalists, David Barr Architects won the competition, with a scheme that tackled the brief as “a series of pieces of a puzzle”. Barr’s winning design is a hybrid apartment building and freestanding house that contains three 50m², single-bedroom apartments in a compact two-storey footprint on a 250m² block. The apartments prioritise livability for inhabitants and neighbours with access to private and communal external areas, clever storage, generous ceiling heights, and high thermal efficiency. Although small, the apartments are spatially efficient and reflect the change in Australian demographics whereby single-person households are the fastest growing household type.

The Gen Y apartments are wrapped around a central courtyard, with two apartments at ground level and one at the upper level. Each has its own independent entry, with the upper-level apartment accessed from a private external staircase. Despite the tight site constraints, the dwellings have private external areas (in the form of garden, deck or balcony). Only two have carports, reflecting changing patterns of car ownership among younger generations, but each has dedicated bike storage areas.

For David Barr, the project provided an opportunity to explore the needs and requirements of a younger generation of potential home buyers. “The parameters we were working with defined a need to house between four and six adults on the site, and there was a lot of flexibility in the proposal,” he says. “We were trying to understand what it means to be a first home buyer in Gen Y, and we took a few cues from research we did which showed that they’d like to be well located, they don’t need a big home, or a large garden; they’d like it to be maintenance free so they can leave and come back easily.

“Most of the other submissions put forward a share-house type arrangement but part of our strategy in entering competitions and in our practice is to deepen and broaden our understanding, so in this case we investigated what a strata entails, how it might offer flexibility, what the planning requirements were, and how far we could push the envelope,” he explains.

Having discovered the site was subject to R40 density and could therefore support multi-residential development, Barr proposed a “mini-apartment block”, initially with four units, but he found that scheme didn’t provide sufficient livability. A revised plan that features three interlocking apartments gave each one access to northern light, cross-flow breezes and a private outdoor space.

For Barr, exploring ideas around strata ownership and how design might incorporate flexibility for apartment owners to make changes in future, without having to seek unanimous approval from the body corporate, “One of the limits of a large apartment block compared to a single residential home is that it’s much harder to grow and augment an apartment over time,” Barr says. “One of the things we set out to do – which is not fully implemented in this project but could be in future examples – was to pre-determine additional components such as pergolas and storage options that residents could add later, if they wanted to.”
His scheme uses the same principle as Alejandro Aravena’s Elemental Half-A-House – the project in Chile that develops ‘half houses’ for families, which can then be easily customised and subsequently added to by their owners, so circumstances and access to finance change.

“These principles are good, and they are one way to tackle affordability,” Barr says, “because they make it easier to add to apartments which means that the stigma attached to statae schemes can be slowly diminished. From the outset, there is an understanding of what other residents can do, and when it’s time to ‘push the button’ the works can go ahead in a straightforward way.”

For the Gen Y house, Barr initially proposed to deliver empty shell apartments that residents could then customise with joinery as it suited them, but LandCorp opted to fully fit it out the apartments for demonstration purposes. The project did however set a new benchmark as one of the first multi-residential buildings in Australia with a strata agreement granting the usage of a shared PV and battery system, which is being monitored on an ongoing basis by the Curtin University Sustainability Policy (CSPS) Institute town, which also mentors the owners regarding their energy usage.

During the year the apartment was on show, about 1300 people – members of the property, design and construction industry, school groups and public – toured the building. The new owners took possession in December 2017 so no post-occupancy evaluations have yet been undertaken, but Barr intends to conduct those in future.

Designed to be a real as a single home, the building was constructed using a combination of materials, most notably cladding made from COLORBOND® steel in Corrugated profile, in the colour Surfmist®, which references the nearby legacy buildings of the Kostof industrial and commercial precinct. The building’s steel cladding also combines with brick and timber to tie in with nearby houses.

Barr says a decision was taken early on to minimise the range of materials externally and internally, because the project can be viewed from all four sides and he wanted to present a cohesive appearance. "We knew that it offers good warranties* and it’s affordable, and requires less maintenance, which for us was an important consideration that addressed the fact that the Gen Y residents won’t have to re-paint."

“This is also a beautiful product that is perfectly suited to this post-industrial area, and the metal roofs on nearby homes,” he says. "Steel, along with the recycled brick walls that became the defining aspect of the gardens, ties back into those precedents; that was a deliberate decision from the beginning of the design process.”

Sustainability was an integral part of the project, Barr says: it achieved a ‘gold’ model ‘Sust Life cycle assessment, recognising a 194 per cent carbon reduction over the life of the project (against a benchmark residential project).

Several factors contributed towards this outcome including the combination of a 90kW PV cell and battery system and high-performance insulation in the form of 150mm Border® SolarSpan® roofing insulated panels made from COLORBOND® steel in the colour Surfmist®, which have a thermal rating of R2.5. The apartments also feature passive sustainability design principles: the interlocking nature of the design means that each dwelling is orientated and arranged to maximise sun sharing, natural light and cross-ventilation.

"The use of 150mm Border® SolarSpan® insulated panels made from COLORBOND® steel on the roof made it very easy to integrate," Barr says. "We had to make sure the sub-contractors were careful with the panels in order to preserve the internal finishes. With this outcome, it meant we didn’t have to dry-line the ceilings with another layer of materials because they came pre-finished with COLORBOND® steel in the colour Surfmist®.

"Barr says material choice also helped meet the building program. "The construction time was nine months, and the use of prefabricated roofing made from Border® SolarSpan® panels and the wall cladding made from COLORBOND® steel in Stramit® Corrugated profile helped to achieve that short time-frame," Barr adds. "It meant the scaffold was reduced, the roof was craned into place, and it made the whole process quicker.”

"Our practice has a history of small alts and adds, and we’ve used COLORBOND® steel products in those projects extensively," Barr says. "We knew that it offers good warranties* and it’s affordable, and requires less maintenance, which for us was an important consideration that addressed the fact that the Gen Y residents won’t have to re-paint."

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The state jury called Gen Y House an inventive scheme that uses an “extending 3D puzzle of interlocking solids and voids” to create a micro apartment building “that is clever, convincing and affordable alternative to the detached family home”.

As Australia tackles an unprecedented housing affordability problem, we need more smart thinking, varied options, innovation and new alternatives in housing, and this project represents a valuable piece of the affordable housing puzzle. SP

*Warranty subject to application and eligibility criteria. For full terms and conditions and to determine the eligibility of your project for warranty visit www.bluescopesteel.com.au or call BlueScope on 1800 064 384.
Tasked with creating Queensland’s first enclosed cycling track, Cox Architecture has responded with a vast, geometrically intricate steel roof frame that honours the craftsmanship of the track below, adding theatre for racing athletes and fans alike.

Words Rob Gillam  Photography Christopher Frederick Jones
Opting for a membrane roof – primarily to allow diffuse daylight in – left the way open for structural steel to star in the show.
Coulson says roof and wall steel structures and temporary works supplied by BlueScope Distribution — 900 tonnes of circular hollow sections and 300 tonnes of steel plate including custom-welded tapering pin joints made from XLERPLATE® steel — were fundamental in achieving the twisting shapes of the velodrome’s saddle-like roof.

Coulson says the design was also deliberately informed by the dynamics of the primary sport played out under it. “The roof was very much influenced by the act of cycling and influenced by the shape of the track. You can see in the plan view that it has a circular sensibility and, in the sectional and elevation views it shows a fluidity in the space. We describe the velodrome as quite kinetic. — It has three inclined walls on the perimeter which spring out above to allow for stage-able seating.”

Once the buildingly footprint was established, Cox and its partners — engineers Arup and building contractor Watpac — sought to create the most efficient, economical and compact structural system possible and steel was always going to be the material to deliver it.

“It would be possible to use some types of laminated timber instead, but we had a number of internal footprint and envelope considerations that required the relative fineness of steel, so we discounted other materials,” Coulson explained.

A planar radial truss system was settled on, for its efficiency and buildability. “We contemplated a variety of different span solutions including portal and non-radial members but to reduce it as an element in the landscape and for the sake of economy we were trying to make the smallest building possible,” he says. “Other construction techniques would have left a much bigger footprint and volume than we required. Modular steel trusses or portal-style solutions can appear quite light, but those roofs are much higher than we have achieved.

“It’s a very efficient building. given the scale and complexity of the roof. The roof benchmarks very well with a primary steel weight of less than 50 kilograms per square metre.”

Watpac Construction design manager Anthony Leonardi agreed that early consultation was vital when coordinating so many major parties. “We get involved with the architect and engineer on the detailing as early as possible and pride ourselves on rapid engagement of the shop detailer — we engage the drafter even before we get a steel fabricator on board!”

The construction sequence for the structural steel roof frame was geometrically and logistically challenging, Leonardi explains: “The first thing erected was the main ‘donut’ in the centre that we call the oculus, which is a fully framed truss structure that sits about 7 to 8 metres deep, with tension rods between CHS chords. It was self-supported on nine Favco 750 crane towers that allowed us to do the sub-structure at the same time. We then proceeded to temporary support for the external columns and started dropping in the 16 main radial trusses that link the external columns to the oculus’s frame.”

“The roof was very much influenced by the act of cycling and influenced by the shape of the track.”
“We chose to use fillet-welded saddle plates on site rather than bolted splices. This meant that major elements of the roof structure could be lifted in, positioned on welded saddle connections and fillet-welded, providing flexibility in terms of tolerances.

Even transporting some of the structural steel elements to site was a major task, with some of the truss sections being 20m x 11m trusses wide. Beenleigh Steel, the steel fabricators, even had to remove some sections at their front gate and force to get the trucks out onto the large steel sections on site and then had to be transported with a police escort in the middle of the night, given the oversized loads.

Arup principal Ian Ainsworth says the structure’s success hinged on early collaboration. “The form of the building, the basics of the roof structure because it had a very tight budget, yet it is in a way that still provided the flexibility to accommodate additional temporary seating in event times, and a range of indoor sports and community uses.

“The roof shape was driven by the plan and the volume. We walked up with an elliptical roof plan with a hyperbolic paraboloid form to get a curve in one direction and convex in another — a saddle shape — albeit a very large-radius one.

“The inclination of the walls, which effectively taper back in, was once again a necessity. We looked to reduce the overall volume of the building as small as possible. From a structural point of view, the inclined columns and a match up excited columns with vertical tie-downs.

“This bi-pod type arrangement around the outside allowed us to deal with and take advantage of the roof having a bit of shape to it, which it does in this case, arched in one direction and acting like a catenary cable in the other. Those shell-type actions in the roof give some large thrusts around the outside that are resisted by those pairs of inclined columns and vertical tie-downs.

“Because we were aiming the cycle track into the centre of a hill and over some quite good ground, we were able to take those thrusts that were coming from the roof down shape into the ground relatively simply and economically. That then meant we could take advantage of the roof shape and design it with some shell action and still do it in an economical way.

Ainsworth says another big driver for Arup was the client preference for the venue being delivered reliably and quickly by local Queensland subcontractors. “So we designed the roof in a way that it could be readily fabricated from available straight steel members, rather than having lots of curved members in three-dimensional trusses that would have been much complicated to weld and transport,” he says.

“The roof structure is mainly made from plane trusses because they are a regular two-dimensional truss. You just lay flat, weld it up, and it’s ready to transport and erect. The roof was also configured so that the temporary central support could be located in the infield area away from the track and the complex concrete base, and substructure works. This allowed roof erection to start early and be carried out in parallel with the concrete works below. Through the use of parametric design and models shared by engineer, architect and shop detailer, the apparently complex geometry was also rationalised and controlled.”

The completed minimalistic structure allowed Arup to achieve its goal of delivering an architecturally striking and functional project for a modest outlay. “We had a comparatively tight budget — about $50 million for a track which represents an extremely good value considering the London Velodrome, which has a similar span, was a $200 million project,” Coulson says. “We were able to produce a solution that maintained great design quality and everyone is delighted by it. The client has achieved popular engagement through its multi-functionality and in producing great race times.

“There are plenty of ways to span 120 metres in steel but we wanted to do it in a way that gave an impressive response to the space because the timber track is such an amazing thing. It’s like an enormous piece of furniture and we wanted the roof to reflect that expressive quality and have that kind of craftsmanship, in steel.

“We wanted to make a valuable contribution to the venue to honour the riders’ performance and provide drama for the spectators. I think we have achieved that and it’s a result that I don’t think will diminish over time.”

PROJECT
Anna Meares Velodrome
CLIENT
Stadium Queensland
ARCHITECT
Cox Architecture
PROJECT TEAM
Richard Coulson, Alastair Richardson, Alex Leese, Robert Collaren
ARCHITECTURAL PHOTOGRAPHER
Benjamin Hosken
PRINCIPAL STEEL COMPONENTS

tons of steel plate and CHS that supports the roof and wall steel structure and temporary works supplied by BlueScope Distribution — 900 tonnes of circular hollow sections and 300 tonnes of steel plate including custom welded tapering pin joints made from ZEPPELIN® steel, two kilometres of lighting support towers made from LYASHT® SupaCee® steel purlins, interior cladding made from COLORBOND® steel in perforated LYASHT MINI® profile, in the colour Shale Grey™

PROJECT CONTRACTOR/BUILDER
Wagnacare Construction

PRINCIPAL STEEL FABRICATOR
Beenleigh Steel Fabrications

PROJECT TIMELINE AND COMPLETION DATE
2013 - 2016

AWARDS
2016 Australian Steel Institute National Steel Excellence Award in Engineering Projects, 2017 Concrete Australia Awards for Excellence — Gold Award for Design Innovation, 2018 Australian Steel Institute National Steel Excellence Award in Engineering Projects — BUILDING SIZE 18,300 m² (steel area), TOTAL PROJECT COST $57.8 million.

Panel Says
This new covered velodrome in Queensland — built for the Commonwealth Games — displays a sophisticated engineering solution in its saddle-shaped roof structure made from steel, which imparts a graceful elegance to the building. The finely crafted structure made from 1200 tonnes of steel plates and CMS that supports the fabric roof a carefully researched to tread the fine line between efficiency and aesthetics. Internally, COLORBOND® steel is perforated LYASHT MINI® profile, in the colour Shale Grey™ “is used in combination with acoustical wool treatments to dampen the noise from crowds and high-speed tracks. The structure provides a great backdrop for the high-intensity theatrical action of the sport.

ABOVE AND OPPOSITE: The inclination of the walls, which effectively taper back in, were a response to reduce the building’s overall volume.

RIGHT: The main ‘donut’ or ‘oculus’ in the centre sits eight-metres deep with tension rods between CHS chords. Between main radial trusses link the external columns to the oculus frame.
The use of BlueScope REDCOR® weathering steel to construct a pedestrian bridge at Deakin University’s Burwood campus has helped overcome a contentious and protracted community debate, to provide an accessible crossing over Gardiners Creek.

Words Rachael Bernstone  Photography: Lisbeth Grassmann, Peter Hyett
Richard Wynne in 2015. Construction began in late Scheme Amendment granted by planning minister though: it was approved following a Planning
The new scheme was not without its challenges and those plans progressed to become the bridge that graces the crossing today.

and those plans progressed to become the bridge which meandered across the gully in line with the trees. That design required four pylons in the sensitive creek corridor and the community feared the significant loss of vegetation that might result from its construction and ongoing maintenance. The University took the proposed design to the Victorian Civil Administrative Appeals Tribunal (VCART), which found in its favour. Mindful of community opinion against the scheme, the University allowed that planning application to lapse and focused on other campus building projects for several years. In 2012, the University approached Melbourne architect Rob Watson, director of water/land/Architecture, to discuss plans for a lighter, less visually imposing structure, its lifespan and its appearance helps the bridge blend into the native bush surroundings. Weathering steel requires little maintenance over its lifespan and its appearance helps the bridge blend into the native bush surroundings.

locals – used the crossing each day, but as it was accessed by steps on the Elgar Road bank, it was inaccessible to people using wheelchairs and prams, or those with other mobility issues. A competition was held and a winning scheme selected, however that proposed design failed to achieve planning approval from Whitehorse Council because of community concerns about the weight and visual imposition of the design for the bridge, which meandered across the gully in line with the trees. That design required four pylons in the sensitive creek corridor and the community feared the significant loss of vegetation that might result from its construction and ongoing maintenance. The University took the proposed design to the Victorian Civil Administrative Appeals Tribunal (VCART), which found in its favour. Mindful of community opinion against the scheme, the University allowed that planning application to lapse and focused on other campus building projects for several years. In 2012, the University approached Melbourne architect Rob Watson, director of water/land/Architecture, to discuss plans for a lighter, less visually imposing structure, and those plans progressed to become the bridge that graces the crossing today.

The new scheme was not without its challenges though: it was approved following a Planning Scheme Amendment granted by planning minister Richard Wynne in 2015. Construction began in late 2016 and the new bridge – called Morgan’s Walk in honour of former Deakin University Chancellor David Morgan AO – officially opened in August 2017 to much fanfare.

For architect Rob Watson, this was a dream commission. As a young architect working in the London offices of Grimshaw and Foster + Partners, he worked on projects such as the British Pavilion for the 1992 World Expo in Seville and Germany’s Reichstag Refurbishment, during which time he was exposed to projects where structural expression and exciting attention to detail were paramount. These characteristics are still of the utmost priority in all of his projects and this bridge represented an ideal opportunity for them to be distilled and even further refined. “While there are some excellent paint systems available for steel structures, on this project any painting would have been problematic,” Watson says. “The bridge has a lifespan of 100-plus years, so it would have needed to be painted perhaps three or four times during its life. Not only did the REDCOR® weathering steel provide an acceptable appearance to the community, that it requires virtually no maintenance was very appealing from a design and whole-life perspective.”

The bridge comprises a series of repetitive modular bays – each about four metres wide by six metres long – that were connected to form a series of six trusses, ranging in length from 16.5 metres to 47 metres. Each modular bay consists of two concrete

Glass partitions fold inwards for easy cleaning (top) and their ethereal appearance from the creek corridor below places the expression that the bridge is entirely made from weathering steel.

This project represented a particularly difficult design problem, Watson says, because the new bridge had to address three major obstacles. The first was access: it had to comply with the requirements of the Disability Discrimination Act to provide safe and easy passage for people of all abilities. Secondly, because the creek corridor is titled Crown Land (the University owns the parcels on either side) the flyover section had to be low maintenance and easily accessible, to avoid protracted and costly access permits. Thirdly, the bridge had to blend in with its native bush surroundings, an especially important consideration to ensure community support for this design.

As part of his solution to address these challenges, Watson chose to build the new 250-metre long bridge using weathering steel, including approximately 200 tonnes of REDCOR® weathering steel in grade W450B and 90 tonnes. Weathering steel, when used in the correct environment, requires little maintenance over its lifespan compared with traditional structural steel, and its appearance helps the bridge blend into the native bush surroundings.

Watson devised an innovative 3D structural system that includes a 200-metre long bridge section spanning over the 85-metre wide parcel of Crown Land – touching the ground at just one point via two V-shaped steel pylons – that minimised the bridge’s impact on the creek corridor, both during initial construction and throughout its projected lifespan.

“None of the other materials are durable enough,” Watson says. “The bridge had to address three major obstacles.”

Weathering steel provides an ideal opportunity for them to be distilled and even further refined. “While there are some excellent paint systems available for steel structures, on this project any painting would have been problematic,” Watson says. “The bridge has a lifespan of 100-plus years, so it would have needed to be painted perhaps three or four times during its life. Not only did the REDCOR® weathering steel provide an acceptable appearance to the community, that it requires virtually no maintenance was very appealing from a design and whole-life perspective.”

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decking panels cast into six fibrous trays of permanent formwork made from REDCOR® weathering steel in grade HW350. These permanent formwork trays give the underside of the bridge the same appearance as the rest of the structure, so that the weathering steel finish is visible from every angle.

Like the entire bridge, the junctions were designed to appear elegant and efficient, particularly because access for future maintenance would be limited. Watson explains. “There was a lot of discussion about the detailing,” says Watson. “Even though it is a simple structure – the way it’s modularised as a 2D truss – we wanted to reject some form into it for practical reasons. The leg anatomy of engineering design – where structures have beauty, because with a bit of thought you can make these things look elegant. At Grimshaw’s and Foster’s offices, we used to slave over the details and we took that approach here. “We studied every junction carefully, to make them look as elegant as possible and so as not to trap water or dirt,” he says. “Originally, McAlpine bars were designed to tie V-pylons together, but in conjunction with Kane we decided to go with 32mm-thick plates of WR350L0 grade REDCOR® weathering steel with a pin joint, using 86mm diameter Duplex steel pins to tie the heads of the two V-pylons.”

Rob Watson’s vision was turned into a buildable reality with structural engineers WSP Australia; modeled and steel detailed by PlanIt Design Group; fabricated off-site by Satellite Engineering; and erected by Head Contractor Kane Constructions, with Associated Rigging and Mactrol Cranes. According to Kane project manager, Mark Spalding, the unusual and complex geometry of the bridge posed different challenges to Kane’s regular projects, which include significant health and education facilities. That complexity was compounded by the fact that access to the creek-side walking paths and the existing crossing had to be maintained throughout construction. “I couldn’t say it wasn’t easy, but we planned it all in minute detail and each plan was meticulously peer-reviewed by independent members of our team. We didn’t have any major issues on-site,” Spalding says. “But I had a few sleepless nights before we started.”

As the project moved towards the site erection stage, Kane, along with Associated Rigging and temporary works engineer Andrew Baignier, devised a detailed works sequence and methodology plan that enabled each step in the rigging process, focusing on safety and build-ability. “The tolerances we were working with were minimal,” Spalding says. “From pin to pin, between the six member plates – a distance of approximately 28 metres – we had a tolerance of just 1mm.”

The bridge supports and walkway truss bays were transported in lengths of about 25 metres and a decision to change from welded truss splice connections to bolted connections shaved two weeks’ worth of site welding from the program. After the trusses were bolted together on the ground, the sections were lifted into place by one of Australia’s largest mobile cranes – Mactrol Cranes’ 800 tonne Demag T280-I – which was located in a carpark on the Elgar Road side for just over two weeks.

“That was a very intense period,” Watson recalls. “We had a huge mobile crane on the embankment, not because of the weight of the parts, but to reach 65m into the creek corridor, sometimes with 50 metre-long elements hanging off the jib.”

“Once the V-pylons and four middle truss sections were in place, Kane shifted to 350- and 380-tonne cranes for the remaining sections,” Watson explains. “The deck trusses went on progressively after each truss section was installed, providing a safe working deck. The deck trays are made from 3mm-thick REDCOR® weathering steel in grade HW350, which was fabricated into form like 140mm-deep baking trays, to act as permanent formwork for the concrete deck panels.”

As a result of Watson’s fully integrated and symmetrical structure, the bridge appears to extend effortlessly across the creek corridor. From a distance, and from certain vantage points along the creek-side walking paths, it can be seen protruding delicately above the tree canopy. The hovering effect is amplified by the integrated handrail and safety enclosure system, which features barely there transparent 17mm-thick clear glass panels mounted on brackets at the base so the glass can pivot upwards for cleaning. “From a distance, all you can see is the structure and the people walking across it,” he says. “It looks deceptively simple, but it took a bit of work.”

So after a false start and initial community backlash, Deakin University’s Burwood campus and local residents finally have a bridge across Gardiners Creek that is accessible to everyone. And, according to local news reports, the community is pleased with its striking weathering steel structure that boasts the unusual ability to both blend in and stand out.

The bridge was officially opened by planning minister Richard Wynne and the University’s vice chancellor, professor Jane den Hollander AO, in August 2017. Minister Wynne explained that the government had intervened at the planning stage because the project was too important to the University and surrounding community to be held up by bureaucracy. “This is a great advancement for one of Melbourne’s flagship universities,” he says. “For too long, people living with a disability, the elderly or people with prams have been without a suitable crossing over the Gardiner’s Creek Reserve.”

Professor den Hollander says that the bridge has strengthened ties between the university and local residents by removing the bottlenecks caused by peak traffic over the creek from the local walking paths that run alongside it. “With the development of the pedestrian crossing, the traffic jams of students – upwards of 40,000 pedestrians a week in peak time – will be taken off the ground and out of the way of community members walking dogs, exercising and enjoying their beautiful reserve.”

“I’m a big admirer of engineering design where structures have beauty, because with a bit of thought you can make these things look elegant.”
In a bid to support affordable housing, a small group of architects led by Breathe Architecture’s Jeremy McLeod in Melbourne has developed a replicable model that is gaining momentum across the country.

Words Rachael Bernstone  Photography Paul Bradshaw

In a bid to support affordable housing, a small group of architects led by Breathe Architecture’s Jeremy McLeod in Melbourne has developed a replicable model that is gaining momentum across the country.

“When we built Nightingale we thought we’d run it until we found the professionals who were already plugging this gap. We never anticipated for a moment that we would start a movement.”

At last count, the Nightingale Housing model for more affordable, community-focused and sustainable housing had netted up one completed project, another nearly finished, one about to commence construction on-site, and 15 more teams looking for suitable locations in cities from Hobart to Brisbane, to Frome.

The altruistic venture is the brainchild of self-confessed left-wing do-gooder Jeremy McLeod, who as a child marched with his parents in Melbourne on social justice and environmental issues. As an architect, he was sure there had to be a way of helping middle- and low-income earners onto the home ownership ladder, so he came up with a plan that he hoped would lead him towards affordable housing’s ‘Holy Grail’.

It started with The Commons, a housing development in Melbourne’s Brunswick, that McLeod used as the prototype for the Nightingale model, without realising at the time that he was founding a new movement.

“The idea of The Commons was that it would be a project for triple-bottom-line housing,” McLeod says. “We wanted to show the market that you could do triple-bottom-line – affordable, social and sustainable – and we wanted to share our knowledge. We saw The Commons as a standalone project that we hoped would encourage market change.

“A lot of people toured the completed project and it won a few awards, and was widely published, but even then it was seen as a blip on the radar, an anomaly, not the future or the new status quo,” he adds.

McLeod says that Nightingale was never intended as a permanent solution, even though it now has 30 licensed architects on board, who can access the dossier of information in case study format that covers project financing, ownership structures, legal frameworks, planning controls and marketing strategies. In essence, it provides a blueprint for socially conscious developers who want to subvert the traditional method of delivery for multi-residential projects.

“The decision to ‘super-charge’ The Commons by creating the Nightingale model came later,” McLeod says. “That decision to make a replicable model that exists so that other architects can deliver the same affordable housing outcomes, that was an afterthought.

“The weird thing about Nightingale is that when we started this, we thought ‘This can’t be the solution, there must be a better model out there somewhere, why can’t we find it?’” he laughs.

“When we built Nightingale we thought we’d run it until we found the professionals who were already plugging this gap. We never anticipated for a moment that we would start a movement.”

ABOVE AND RIGHT: Building on the success of Brunswick’s The Commons project (depicted far right), Nightingale 1.0 by Breathe Architecture centres 30 apartments, 57 bike parking spaces and zero on-site carparking. It’s the first in a series of affordable apartment developments taking place across Australia.
Those architects have tapped into a generous appetite for sustainable and affordable housing in cities around Australia, where housing affordability is at an all-time low.

Federal Governments have discussed introducing several structural reforms to address housing affordability. For example, Ken Henry’s review of the tax system in 2009 devoted two sections to Housing Affordability and Housing Assistance.

Encouragingly, state and local governments have made some progress in the area of affordable housing. The City of Sydney introduced targets for 2030 around the provision of social and affordable housing, and has incorporated both categories in the development of two of its own sites in Ultimo and Pyrmont. Furthermore, affordability remains a growing problem, especially for so-called key workers – including nurses, teachers and police – who in parts of Australia can no longer afford to live near where they work.

Nightingale is not the only answer to Australia’s affordable housing dilemma crisis, but it’s a useful part of the puzzle, thanks to its reduced up-front apartment costs, re-sale prices that are pegged to average growth levels in the suburbs, that apartments are sold with a real off-market to those on a purchaser’s list, and the in-built sense of community that results from common rooftop laundry lines and vegetable gardens.

In Victoria, where the model was born, Nightingale recently received a $100,000 grant from the Victorian Government to replicate and extend its sustainability achievements across the state, with funds earmarked for research on existing sites and for the development of the next major project: the Nightingale Village at Brunswick, currently being designed by seven architect-led teams.

“The new grant targets two things: sustainability and community,” McLeod explains. “On one side, we will work with Melbourne University to monitor internal temperatures, air quality and daylight quality, to benchmark that data against every new and carbon-negative projects from The Concourse and Nightingale 1.0. That will help us determine whether these projects are achieving their objectives and how we might improve on future performance.”

“The second part of the grant looks at how we might build meaningful communities,” he adds. “We want to engage with potential residents and work out how to build deliberative housing, so the second part of the grant is a loan to fund a piece of technology that we are hoping built that will provide real-time data from resident groups about their preferences and price points, so we can drill down into the needs of the 200 people currently on our waiting lists.”

The number of people who are keen to invest in the Nightingale Model product has surprised McLeod, although he concedes there is nothing he’d rather do than solve the problem of affordable housing. “We never approached this as a gap in the market, we looked at it from the point of view that our city needs us,” he says. “For an architect, if we can’t build triple-bottom housing, we won’t build them. If you talk to almost anyone aged 35 in our city, they all care deeply about sustainability and the future in our city, and about building meaningful communities.”

“BlueScope is one of the last fundamental Australian steel manufacturers so we met with their sustainability team to understand how products such as roofing made from COLORBOND® Coolmax® steel in the colour Whitehaven® can provide high cooling performance.”

In another big win for the model, Nightingale announced it is working with financial institutions including SEFA, Christian Super, Brightlight and NAB, to enable institutional investors to invest in the development of future Nightingale projects.

As well as being at the forefront of a social movement, Nightingale aims to be a leader in the design and construction industry and is supported in this endeavour by its partnership with BlueScope, having met with BlueScope’s Innovation team to discuss trends and provide feedback on some of the initiatives they are working on.

“BlueScope is one of the last fundamental Australian steel manufacturers so we met with them to understand how products such as roofing made from COLORBOND® Coolmax® steel in the colour Whitehaven® – which we’ve used on Nightingale 1.0 – can provide high cooling performance,” McLeod says.

Having developed a model, then shared it with his peers – an unusual step in a profession that tends to keep its intellectual property under wraps – McLeod was honoured with the Australian Institute of Architect’s Leadership in Sustainability Prize at the 2016 Australian Achievement in Architecture Awards, where the jury called the development of Nightingale “truly inspiring.”

“Both McLeod’s built work and advocacy are characterised by a generosity of spirit and overwhelming optimism – qualities that make him a true leader in the field of sustainability,” the jury citation read. “That he has made public all of Breathe Architecture’s relevant intellectual property – including research, feasibility studies and business strategies – stands as testament to his understanding that real change in the field of sustainability requires the commitment and capabilities of more than one firm and indeed the wider community.”

This is welcome acknowledgement that the Nightingale model holds endless potential for revolutionary change, at a time it is much-needed.
NEW CORNER OF THE GLOBE

An old outback pub has undergone a remarkable transformation through the application of contemporary steel.

Words: Micky Pinkerton  Photography: Christopher Frederick Jones
Barcaldine sits smack-bang in the middle of Queensland, atop two aquifers and at the crossroads of the Capricorn and Landsborough Highways. It’s a town where you’ll find frequent reminders of this fortune of geography and commerce, all the streets bear the names of trees, and road-trains packed with livestock rumble through regularly on their way to market.

Back in the 1880s these layers of Barcaldine’s identity famously converged, when striking shearers held their assemblies in the shade of a giant Ghost Gum on Oak Street. Legend has it that beneath its branches the manifesto which led to the formation of the Australian Labor Party was first read out. The rest, as they say, is history and while the Tree of Knowledge, as it became known, is now dead its remains have been preserved and sheathed in a beautiful commemorative structure which went on to receive the Lachlan Macquarie Award for Heritage Architecture and a National Commendation for Public Architecture at the Australian Institute of Architects 2010 National Architecture Awards.

That project, by Brian Hooper Architects and m3architecture, was the first piece of a broader masterplan for Barcaldine’s cultural and tourism precinct. The two practices have once again joined forces to deliver the next stage: a new Information Centre which also houses a gallery, function room and history room. It’s a project with a less iconic genesis but which delves just as much into the territory of archetypes and symbolism – and what place they have in our ever-changing present.

Barcaldine Regional Council purchased the Globe Hotel in 2011, a block and a half from the Tree of Knowledge. Its aims were not only to provide a new and larger Information Centre for an improved visitor experience, but also to reduce congestion around the tree and encourage patronage of local businesses through increased foot traffic. The pub was a typical example of an early 20th Century single-skin timber construction, but with unsound perimeter verandahs and the rest of the building in general disrepair, Council’s intent was to demolish. The architects thought otherwise, as Brian Hooper explains.

“The character of the town is reflected in its old building stock. We knew it would be a challenge to retain but we felt it was just too valuable to the town’s character. In demolishing we would also have lost the opportunity to retain the footpath verandah. In Western Queensland with its harsh environment, these verandahs effectively provide a respite for the public.”

The building had no official heritage status, as the project description says it “resides in the shadow...”

“REDCOR® weathering steel was selected for its robustness and the patina of deep, dark red which is reminiscent of those beautiful earthy tones of the Western Queensland Plains.”

ABOVE: The panels of perforated REDCOR® steel feature a mélange of three patterns that each have a relationship to the site.
BELOW: In opting to adaptively re-use the building the architects were able to retain the verandah which, with its new wrap made from REDCOR® steel, now provides shade on two levels.
and joists were strengthened with steel I-beams. A basement had to be hand-dug to allow ventilation, an
exception. Sitting just three inches off the ground, this deck is uncovered on any given day. The Globe was no
turns obstinate or generous depending on what
its capricious partner in these kinds of projects –
As any designer knows, the past can be a silent,
scheme presented by the architects won the day.
Council during the earlier project, the adaptive re-use
of a typology”. Thanks to the trust developed with
of keeping and illustrating the principal characteristics
between the threshold for state listing and the joy
in order to achieve the loads required to bring
the building up to code. Clever detailing allows the
incidental structural steel to do its bit without
compromising the overall language of the original
timber skin.
In contrast, the new verandah does not
hold back and once colour and materiality to
celebrate the simple geometry of the proud old
hotel. An impression of scale is formed from perforated
fin-sheets REDCOR® weathering steel wraps
around the northern and western facades, creating
a bold juxtaposition. In the change of usage of the
building from commercial to civic, the overt written
markers of history on the pub made way for a spare
white canvas, and this generous steel screen,
which provides shade on both levels, created
an opportunity for local references to be subtly
re-woven into the building’s fabric.
Various motifs are incorporated in the lattice work
of the old verandah, the zig-zagging metal braces of
double-decker triple road trains that roll by
and the tulip ornamentation of the fanlight above the
door of the hotel rooms. Having used REDCOR®
weathering steel before, Hooper understood the
unique properties of the material well.
“REDCOR® weathering steel was selected for its
robustness and the patina of deep, dark red which
is reminiscent of those beautiful earthy tones of
the Western Queensland Plains,” he says. “It’s such a
great material to be able to work with, particularly
as we were interested in a pattern that pulsates
with the slight change
in perforation size as you move along it. This is
not something you could do in many products,
particularly in such a harsh environment, and
because REDCOR® weathering steel is self-
protecting and its corrosion is controlled,
it will be there for a very long time to come.”

As for the Tree of Knowledge, an important
consideration in this project was using local
tradesaborously possible and the architects
took time and care to understand what skills
were available in the region when designing and
specifying. For The Globe they worked with a
Barcaldine-based steel fabricator and plumber to
develop neat solutions to integrate flashings with
the polycarbonate screens and the roof.
Roofing and guttering made from COLORBOND®
steel in Drusk Custom ORB® profile in the
colour Surfmist® was selected for many reasons.
“For its ability to reflect heat and minimise the amount
of energy that surfaces such as a roof absorb in an
outback environment, a roof made from COLORBOND®
steel is practical and pragmatic choice,” explains Lavery.}

“For its ability to reflect heat and minimise the amount of energy that surfaces such as a roof absorb in an outback environment, a roof made from COLORBOND® steel in the colour Surfmist® is a practical and pragmatic choice.”

ABOVE: The Globe and the Tree of Life (seen in the distance here from the old pub’s upper verandah) bookend the main street of Barcaldine.

LEFT: Roofing and guttering made from COLORBOND® steel in the colour Surfmist® was designed and fabricated to integrate neatly with the flashings and polycarbonate screens.

TOP: The Globe is the second collaboration in Barcaldine for m3architecture and Brian Hooper Architects. In 2010 they received a National Commendation for Public Architecture at the Australian Institute of Architects National Architecture Awards for their sensitive treatment of the depicted symbolic Tree of Knowledge on site.
“It also provides a really beautiful backdrop to the REDCOR® weathering steel itself; it becomes a frame which allows the REDCOR® steel to star.”

The Hooper and m3 partnership is clearly a successful one, despite the 650 kilometres between them. It therefore comes as no surprise that this symbiosis is reflected in each architect’s favourite aspect of the project.

“We’ve retained the spirit and the character of the building but we’ve done it in a contemporary way and I’m pretty excited about that,” says Lavery. “The layering of framing, materials and space is my favourite aspect of the work, and then what comes with this layering, such as the interest created by shadow and the views into and through the building. Each aspect of the project offers something new, and each aspect undergoes dramatic change throughout a day. Those components of the design give buildings such as this a dynamic feel.”

Hooper’s reflection elicits a similar appraisal:

“The re-purposing of the building has really been the joy in terms of being able to retain it, and the layering of all those materials for such a simple single-skinned building gives it that depth right through,” he says. “It’s not a one-dimensional building. Each of those individual elevations are very different and whilst they all do similar things, such as protecting the internal single-skin layering, the combination of all those materials juxtaposed against each other is what really makes it a successful project.”

The architects convey that the response from the Barcaldine community has been fantastic and the Council’s leap-of-faith to embrace the challenge of adaptive re-use has been further rewarded with a second National Award for Public Architecture. The Globe’s growing audiences clearly appreciate the sensitive interleaving of old and new, allowing a physical space for the narratives of the past to be acknowledged and enjoyed in a contemporary building, in a region looking to the future.
Designed by Melbourne-based architects Six Degrees, the firm’s ‘chill factor’ is evident in this ‘hot’ new accommodation that harnesses steel to blend into its rural setting.

Words Peter Hyatt Photography Trevor Mein; Peter Hyatt
Seasonal changes are captured by the soft undulations and sheen of the suites’ exteriors, made from ZINCALUME® steel in LYSAGHT CUSTOM ORB ACCENT® 35 profile.

Six Degrees’ response of a six-part steel pavilion is one of subtle, thoughtful interpretation. Understatement though doesn’t mean anonymous or invisible. The form works, much like Brian’s reputation for culinary innovation, reveals courage and resolve. With such recognition comes high expectation. The apartments are designed to offer a more complete and immersive experience by adding a further dimension to Brian’s celebrity.

For the restaurant’s frequent international visitors, it’s an opportunity for a specifically regional dining experience – much of it derived from produce grown on the property, the next sourced locally. The area’s history of shearing sheds, huts and farmhouses all inform the new buildings. These qualities and materials that comprise rural architecture. Our work at Brae is derived from numerous farm buildings. Fragments of recent and early examples prompt memories that we have tried in this project.

Meeting guest expectations beyond the unique culinary experience was also part of the architect’s brief. “Brian’s clientele,” says Legge, “come to experience an Australian rural setting and that’s what we have tried to deliver.”

Birregurra and Brae might appear to be names strangely at odds – one proudly indigenous Australian and meaning ‘kangaroo camp’, the other fiercely Scottish and referring to the slope or ‘Ridge’. It’s all at an uphill, but ultimately successful, connection.

Design project director James Legge of Six Degrees provides a contemporary take of a songline in his reading of the land. He sees the project as a modern interpretation of critical regionalism: “Where you also play off and ‘riff’, if you like, with some of the materials, materials, details and forms of the immediate setting,” says Legge.

Legge parallels music and architecture. He extols the idea that the jazz master Herbie Hancock improvised so brilliantly; it’s a quality he sees as possible and desirable in architecture. “You take an idea and riff with it,” he says. “You’re improvising around that basic idea of a rural Australian shed. Of course we’re not the first to do it and we won’t be the last, but it can be a very inventive way to work.”

A lot of it was around looking at some of those archetypal rural buildings and sheds, and materials that comprise rural architecture. Our work at Brae is derived from numerous farm buildings. Fragments of recent and early examples prompt memories that we have tried to reflect in this project.

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**The overpainting of ZINCALUME® steel or R steel in LYSAGHT CUSTOM ORB ACCENT® 35 profile complete an elegant new pavilion in Birregurra’s summer straw paddocks. To match a patch of darkly stained timber roofing and walling at the building’s far end, Six Degrees project architect John Hajko elected to post-paint ZINCALUME® steel in a custom black colour.**

Hajko says the profile is a larger version of CUSTOM ORB® with strikingly deep corrugations. “Who were really keen to use it, as it has a much larger-scale profile,” says Hajko. The LYSAGHT CUSTOM ORB ACCENT® 35 profile size is important in subtly scaling the project to relate to these architectural buildings.

Rather than cropping or shortening, this property features six guest apartments – lodgings for the high profile. Brae restaurant sat on a 30-acre organic farm. With a population of around 1,300 and being a two-hour drive south-west of Melbourne, this lid-back bush township has a brand new mojo and not so-quiet fame thanks to Brae as its shooting star. With a population of around 1,300 and being a two-hour drive south-west of Melbourne, this lid-back bush township has a brand new mojo and not so-quiet fame thanks to Brae as its shooting star.

Inclusion in the world’s top 50 restaurants last year only added to its reputation, and that of chef Dan Hunter, renowned for his culinary sensations.

ABOVE AND OPPOSITE: Brae’s sustainability credentials, from menu to architecture, stem from the local landscape. Viewed through a flock of Ibis, a blend of paddocks and edible gardens are complemented by simple, pavilion-style accommodation with roofing and cladding made from ZINCALUME® steel, drawn from the existing historic homestead.
His enthusiasm for steel as a quintessential Australian building material sees it embedded within the qualities you want to get right’." He stresses that the product selection for the suites was based around not only practical performance but that they also sought subtlety and suitability for the environment. “It’s not about one scale only. As a visitor, we ask: How do you experience such a place and truly feel its texture? What do you actually touch when you open the door, what does it feel like? Where is the texture of the building on approach and is there a human scale to the building? Those are among the qualities you want to get right.”

“We needed to consider the process of arrival and separation between dwellings and restaurant,” he adds. “You might come halfway around the world, so the question is what is it you will do and how can we make this a fantastic rural experience beyond the meal?”

Brae’s sustainability story includes home-grown and locally sourced produce right through to its new apartments operating at net-zero energy and water usage – as much energy produced as obviously don’t live here, guests are using resources fairly heavily.” Solar panels and harvested water storage tanks feature prominently as does a worm farm wastewater treatment system and sympathetic landscaping using recycled materials.

He is a great believer in architecture as a first encounter and lasting impression. “For Brae, we discussed the idea of visiting friends in the countryside and of being made to feel welcome and ‘at home’ during our stay. That was definitely the quality we wanted in this project.”

In this rhythmic, distinctly Australian landscape, evocative in light and topography, Brae becomes a series of silver licks. As a fusion of jazz riffs, here clever hands and culinary bravado provide an added edge. SP
A modular prefabrication program drove the rapid pop-up of this all-steel education facility, which showcases design flair and refinement rarely associated with temporary buildings.

With a bit of clever planning and consideration you can easily get a much more delicate, joyous and interesting space than a dour site shed plonked on the ground.

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