115
AUGUST 2013
ARCHITECTURAL
STEEL INNOVATION
WITH BLUESCOPE STEEL

STEEL PROFILE

COLLINS AND TURNER
WATERLOO YOUTH FAMILY AND COMMUNITY CENTRE

JOHN WARDLE ARCHITECTS
SHEARER'S QUARTERS

IN PROFILE:
SHELLEY PENN

EDITORIAL

Welcome to *Steel Profile* #115.

As always, we are proud to present a profile of the country's steel-inspired architectural projects and some glimpses into the creative minds responsible for them – the latter especially in the form of our dialogue with Australian Institute of Architects immediate past president, Shelley Penn.

BlueScope Steel continues to support excellence in Australian architecture as the Principal Corporate Partner of the National Architecture Conference which, fittingly, this year challenged notions of materiality and explored contemporary material applications.

Unpainted steel cladding features prominently in two projects this issue. Though one is by nature more humble than the other, both share a visceral design language that is spoken in assured, elemental form.

We trust you will enjoy the issue. 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 a director of SJB Architects NSW. He was awarded the 40th Anniversary Churchill Fellowship in 2006 to study alternatives to conventional models of urban design. SJB Architects recently won two Australian Institute of Architects NSW Awards for Multiple Housing.

More than anything, he loves to design buildings

FRANK STANISIC

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

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

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

SAM BRESNEHAN

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

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

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Waterloo Youth Family and Community Centre

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BREATHABLE BUILDING

Briefed to convert an amenities block into a community centre, the architects imagined a giant woven sculpture of plants and metal. With a supportive client and stakeholders, that unlikely idea is now a reality.

Words **Micky Pinkerton** Photography **Josef Nalevansky; Paul Bradshaw; Richard Glover**

ARCHITECT Collins and Turner
PROJECT Waterloo Youth Family and Community Centre
LOCATION Waterloo, Sydney, New South Wales

5

ABOVE: The aviary-like super-structure features a range of galvanized tubes made from CHS steel and is consciously expressed – for now. Nature is already transforming it into a large green sculpture

RIGHT: Webforge grating wraps around the building at ground level, while Securifor 358 mesh sheaths the more angular middle section. Both are non-climbable – and perfect trellises for the native vines

BELOW: The roof top garden, which overlooks the local skate park, has almost doubled the Centre's usable space. It is used for meetings, events and permaculture classes

Near the entrance of this memorable building, several triangular steel panels converge to a central node. The galvanising has dulled to a matte grey and the mesh will soon be covered in native vines, but for now the geometric beauty is on display, showing the angles intersecting at a common point. It's a subtle visual metaphor for the genesis of the building itself, where various people, coming from different perspectives, have crossed paths at a specific moment to create something truly remarkable. It's a story 40 years in the making.

In 1974 South Sydney Youth Services was established by a group of local parents who were concerned about the welfare of neighbourhood kids. Since those early days, with just one worker in an outreach capacity, the organisation has grown to employ more than 30 people and offers a range of community services from Marrickville to Maroubra. For the past 18 years they have called a converted toilet block at Waterloo Oval home. By 'converted', think toilets pulled out and some carpet put in.

On the other side of the world, architects Huw Turner and Penny Collins met in Germany while working on a large-scale commercial project for Foster + Partners. It wasn't long before they were partners in life as well as design, and after almost a decade working for Foster, they moved to Sydney to set up shop in 2002.

Ultimately over a thousand shop drawings were produced and four steel fabricators were used on the build

By 2008 the youth centre 'bunker' was well and truly overdue for an update and City of Sydney stepped in, armed with some Federal funding. But the brief wasn't straightforward – they wanted the original building to be re-used and a green roof incorporated, as residential developments now overlook Waterloo Park and there was a desire to soften the Centre's visual impact.

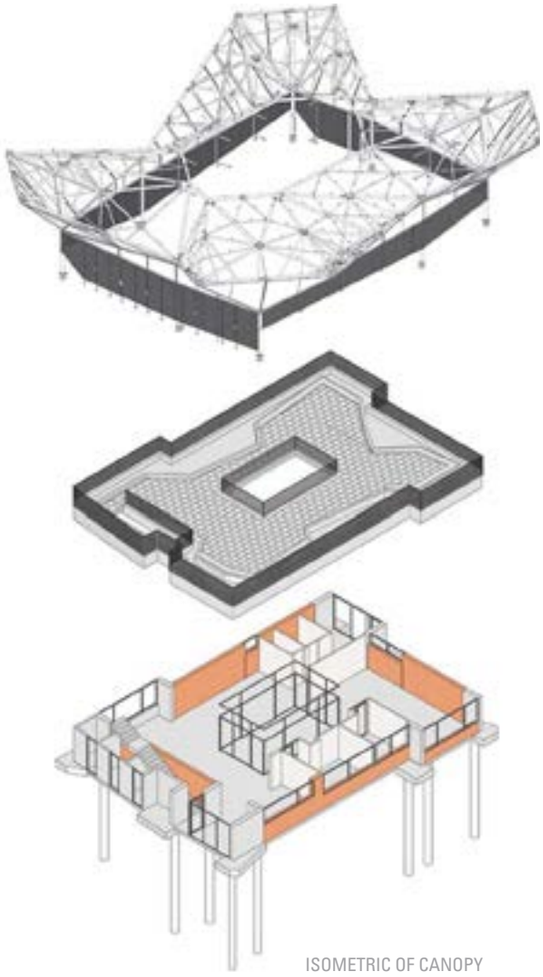
Three architectural practices were invited to participate in an ideas competition. Collins and Turner, with an office just down the road from the site, knew the area well and used the green roof stipulation as their starting point. Exploring ideas for a screen that wrapped around the building, they developed a canopy-like structure, part inspired by Cedric Price's Aviary at London Zoo. Various versions of the scheme were imagined, from very formal, rectangular options to more ambitious, triangular forms.

"When it came down to it we thought the sculptural scheme was too 'out there' and presented the more conventional-looking one," explains Huw Turner. "But we included the sketches of the angular screen at the end and the panel really reacted to it. Then they called back the next day – Friday – and said 'Can you show us a model of that on Monday?' So we raced off to Spotlight to get sanding blocks and knitting needles and bits of string."

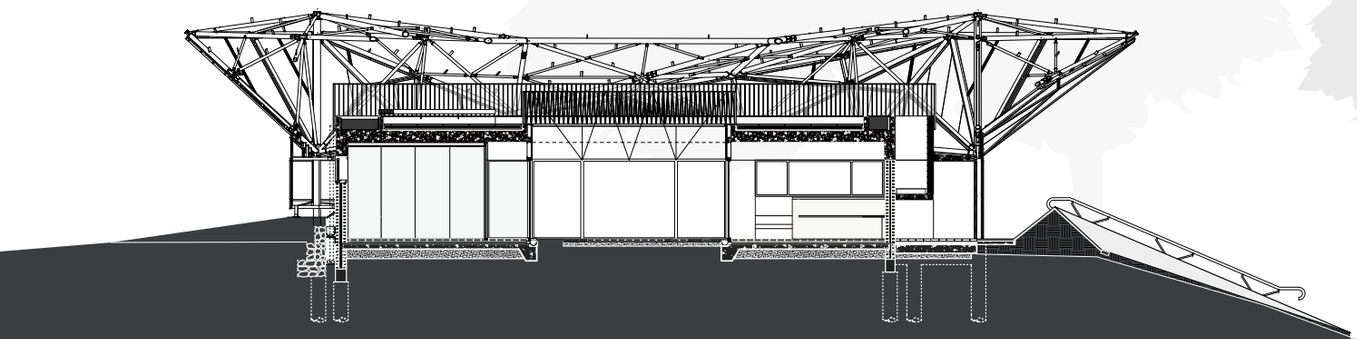
The model was duly presented and the next day they were told they had the job.

Although Council's instinctive reaction to the canopy was positive, it then produced a raft of conditions that the architects had to meet. For one, it couldn't be climbable or vulnerable to vandalism. Secondly, if the Centre or the park were to function in a different way in the future, then there was a chance that the canopy (or the building, for that matter) wouldn't be needed and each therefore had to be entirely independent of the other. Collins and Turner set to work with Arup, developing a parametric model which was included in the tender package. Ultimately over a thousand shop drawings were produced and four steel fabricators were used on the build.

The super-structure uses a range of galvanised tubes made from CHS steel, onto which three different claddings have been attached to its lower, middle and upper sections. "In the detailing of these different surfaces we came up with a common angle frame detail," says Turner, "so whichever mesh you are putting on, it's with the same perimeter frame around it. It's tube and plate,



ISOMETRIC OF CANOPY



EAST-WEST SECTION

and every connection is bolted. There's a common philosophy for how these connections are assembled – there's a 125mm offset from the centre line of the tubes to the outer face of the cleats, which then bolt these sub-frames in. That, then, sets everything out."

At ground level the structure is wrapped in Webforge floor grating, usually seen as walkways in more industrial settings. Moving up to the sculptured mid-section of the building, Securifor 358 – an anti-climb mesh with a finer grillage normally used in high security environments – was specified. Above that, a Ronstan wire system completes the canopy.

"We were originally going to repeat the Webforge for the final tier but when the tenders came back and we were looking to save some dollars one of the bigger cost savings was to just use a wire structure instead. This system is used for growing plants all the time, and it's like a cat's cradle of cabling."

All three products allow for vines to weave in and out and around the building. The inspiration might have been an aviary, but standing on the rooftop the feeling is anything but cage-like. The plants have already turned the garden – which has almost doubled the centre's usable space – into a delightfully unruly landscape.

This wayward 3D tapestry in various shades of green has a more conventional rectangular frame beneath, made from 171 CHS steel, which provides the strength to make it a standalone structure, as well as easily demountable. Turner explains: "The canopy has a series of eight columns that come down on the four corners and at the mid-points, where the valleys come down. They have a base-plate bolted down to a concrete foundation. All you have to do it is take some pavers away and reveal the base plate and start un-bolting.

"The canopy could not have been realised in anything other than steel. It needed to be light-weight and yet strong, and there is no other material that could achieve that."

With four different contributing steel fabricators, off-site pre-assembly was not an option, and so the coordination of this jigsaw puzzle of members and meshes on site is a credit to the builder. Turner reports that some fine-tuning was required to get things into shape but otherwise the canopy's construction was exemplary.

Of course, the building is more than just the canopy and the architects' skill can also be seen inside, where they have inverted the layout to maximise user space. After considering multiple arrangements, Collins and Turner settled on an internal courtyard with a racetrack corridor wrapped around it. Offices and meeting rooms hang off this circulation space, while the courtyard provides an additional meeting area and allows fresh air and daylight into this passively ventilated facility. Small bay windows have been added at the building's corners, where the plantings can be seen twisting through the mesh wrap. Despite the clatter of the adjacent skate park, there's a relaxed atmosphere inside as staff go about their work.

Half-way through construction the organisation decided it had outgrown its original name and ran a competition for a new handle, one which more accurately reflected the diverse groups of people it now serves. A 12-year-old suggested 'weave', a word which director Shane Brown says "speaks to the interwoven lives we lead and the dependence we have on each other as a community". It's a happy coincidence that it also speaks to the relationship between the organic and man-made that the project makes so evident.

While it is easy to be dazzled by the canopy and the efficient internal layout, it's arguable that the greatest innovation of this project is in the ground. On approach to the building a series of stealth bomber-shaped steel panels emerge from the ground at different angles, mirroring the sculptural shapes of the building. They are the design team's solution to the standard council requirement for retaining walls and allow groundsmen to mow around the building. Not wanting to have a series of right-angled banks interfere with the fractal geometry of the building, Collins and Turner, and the landscape architects, Terragram, worked together to develop revetment walls: solid galvanised steel panels that are triangulated and then perforated, to allow plants to grow through.

"They are very simple," says Turner. "They're made from 5mm steel plate and have a concrete strip at the top and the bottom to hold them in place. Dirt is packed behind and that gives them their strength. They are bolted together – there's a fold with bulk mechanical fixing between all the panels. Threaded rods come out of the panels and the concrete is cast up to them, helping to lock them all together."

Turner is looking forward to watching the building change with time, seeing the succulents sprout through the revetment walls, the vines enfold the canopy and the locals enjoy a building they deserve. The people at Weave do a lot with little and the same could be said of all involved on this project – they've taken a tight budget and a demanding brief to produce something that is greater than the sum of its cost-effective, almost prosaic parts. That's what you get when skilled designers, a trusting client and the dreams of a community are intertwined. **SP**

BELOW: A common angle frame detail made from tube and plate allows a consistent casing for each mesh. Despite its complex fractal geometry, the entire canopy is demountable and independent of the original building – a key requirement of the brief

BOTTOM: Triangulated galvanised steel panels form revetment walls around the base of the building and have been perforated to allow plants to grow through

PB

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PB

RG

PANEL SAYS

This highly creative and complex project presents as a piece of sculpture in the park, but it hides an original concrete building that has been encased in an aviary-type structure made from steel framing and fine steel mesh. This cost-effective response is totally integrated into its park-side setting by virtue of the new planting that grows around, above and through the steel structure. By employing a strategy to re-use the existing building without making that obvious to visitors and park users, the architects have produced an incredibly robust solution that is appealing to look at and resistant to graffiti and damage, thanks to its shaggy green skin.

TOP: A racetrack corridor wraps around a central courtyard, with offices and meeting spaces hanging off this light and airy circulation space. Local urban artists were invited to provide the murals – a neat reversal of the usual graffiti-amenities block encounter

LEFT: The courtyard provides an additional meeting space and allows fresh air and daylight into the passively ventilated facility

PROJECT Waterloo Youth Family and Community Centre **CLIENT** City Projects, City of Sydney **ARCHITECT** Collins and Turner **PROJECT TEAM** Penny Collins, Huw Turner, Lucy Humphrey, Markus Bruenjes **STRUCTURAL ENGINEER** Arup **BUILDER** Project Corp **STEEL FABRICATORS** Performance Engineering Group, LDG Engineering, Woodies Metalwork, E-Space Engineering **SHOP DRAWING CONTRACTOR** Wayne Scudds **LANDSCAPE ARCHITECTS** erragram **PRINCIPAL STEEL COMPONENTS** CHS tube in various thicknesses to 171mm; 5mm steel plate; Webforge mesh; Securifor 358 mesh; Ronstan cabling **PROJECT TIMEFRAME** Winter 2010 – Winter 2012 **AWARDS** 2013 Australian Institute of Architects New South Wales, Sulman Medal; 2013 AIA NSW Awards – Sustainable Architecture Award **BUILDING SIZE** 510m^2 in total (252m^2 offices; 237m^2 roof terrace, 21m^2 courtyard) **TOTAL PROJECT COST** $2.6 million

ISLAND TREASURE

An architect known for crafted elegance has once again triumphed with his undeniably magical Bruny Island Shearer's Quarters.

Words **Peter Hyatt** Photography **Jenny Hyatt; Peter Hyatt; Trevor Mein**

ARCHITECT John Wardle Architects
PROJECT Shearer's Quarters
LOCATION North Bruny Island, Tasmania

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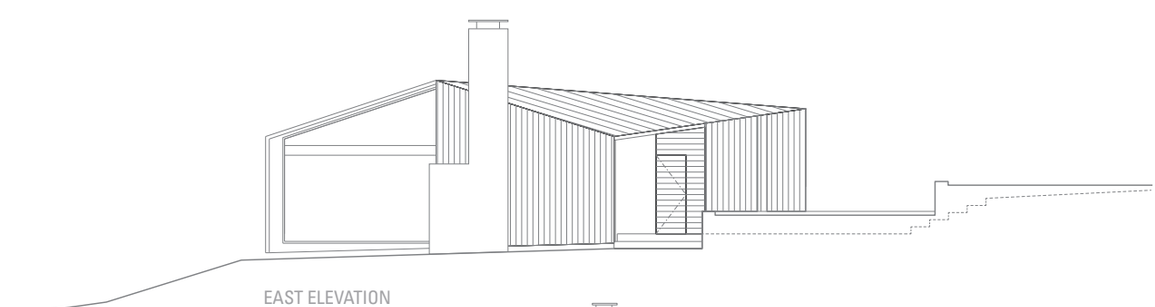
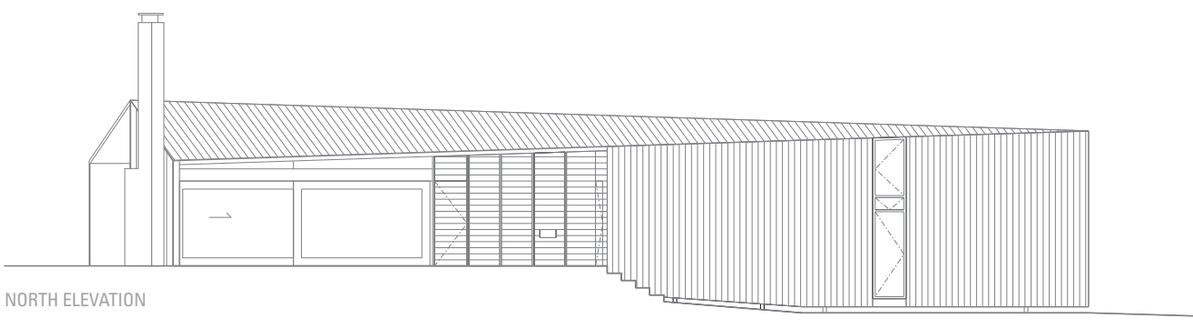
The plan morphs along its length to shift the profile of a slender skillion at the western end to a broad gable at the east



EAST ELEVATION



NORTH ELEVATION

At first glance, two of Tasmania's best architectural achievements could hardly be more different. David Walsh's Museum of Old and New Art (MONA) is the subterranean treasure trove some liken to Gehry's Guggenheim Museum in Bilbao, such is its crowd-pulling effect and boon to the State economy. John Wardle's diminutive, subordinate Shearer's Quarters is the less visible star, yet it is remarkably undiminished by comparison.

These two projects represent a real coming-of-age for contemporary design in Tasmania. Better known for its heritage preservation projects, the Apple Isle is quickly forging a whole new reputation with such entrepreneurial ventures arising from private venture capital. Walsh's mathematical genius inspired the recycling of casino winnings as an extraordinary example of creative philanthropy.

An undisputed drawcard among Australian galleries, MONA relies as much on Nonda Katsalidis' design, waterfront setting and intuitive curatorial touch as any imported touring exhibition. Externally sheathed with apricot-hued cladding made from BlueScope XLERPLATE® weathering steel, MONA's cavernous interior offers visitors a memorable, middle-earth experience.

At the opposite end of the budget spectrum, and far more distant from public gaze, the Shearer's Quarters is the exemplar of honed craft.

With a gleaming, tightly-stitched cloak made from corrugated steel and honeyed internal timbers, John Wardle has created not an agricultural sweatshop but a Zen-like meditation.

His epiphany might have taken 10 years to realise, but sea-air and a memory of orchards and shearing sheds combine to make the wait worthwhile.

The aptly-named property 'Waterview' is a working sheep farm of 440 hectares operated by the Wardle family for the last 10 years. The priority to date has been the rehabilitation of landscape, with some 150 hectares reserved for conservation purposes and more than 7000 indigenous trees planted.

The Shearer's Quarters is located on the site of an old shearing shed destroyed by fire in the 1980s. Of great significance is the relationship to a cottage built in 1840 for Captain James Kelly as part of a colonial land grant.

Wardle's design fully grasps a beguiling, yet potentially elusive, opportunity. The new defers to the old yet the interplay between them strengthens both in the process. A painterly appreciation of vista appears to draw closer a dam immediately to the south, rolling hills and bay to the south-east and a vast window wall to the east. Adjacent to the largest window rises a full-height bookcase fashioned, origami-like, from BlueScope XLERPLATE® steel. It's an ingeniously refined solution; strong yet so slender as to almost provide a floating, unsupported library wall.

Wardle's lustrous, broadly delta-shaped shell is highly inventive. It speaks of prototype rather than stereotype – as if the architect in preparation and modelling has taken a pair of scissors to playing cards to create a playfully serious lightweight model. Windows and walls flex, open and yield in surprising ways. Other windows and breezeways are artfully concealed, creating a joyful blend of design detail and meticulous carpentry.

The project's use of authentic materials and patterns are realised in an entirely modern context. Others have apparently formed a similar view and the result includes recognition as diverse as a 2012 Australian Institute of Architects Robin Boyd Award and Australian Institute of Architects Tasmanian Chapter COLORBOND® Award for Steel Architecture, as well as a 2012 World Architecture Festival Villa Award, among others.

Wardle's fascination with lightweight design and construction is apparent in all manner of artwork and model transport throughout his home and office. Captain Kelly's original kitchen in the old cottage contains numerous objects and curios seemingly from some faded emporium or bygone era.

His epiphany might have taken 10 years to realise, but sea-air and a memory of orchards and shearing sheds combine to make the wait worthwhile

And elsewhere are delicate etchings, a glider and early plywood yacht suspended above the kitchen table – all reminders of a way of seeing and working.

"Our architecture has a very strong narrative. It's expressive of the process and the making," he says.

Wardle emphasises that good architecture should tell a story appropriate to its place and the ideas of everyone involved. "I want to go beyond the first appearance of a structure and reveal those new layers on each visit."

He was wary of transplanting a heavy object inconsistent with the settlement and use as a working farm. "It was never to be a foreign object. It comes from being curious and appreciating the social and cultural history of place." His investigative attitude and patience – a decade in the making – has paid off.

He admits such good citizenship isn't entirely selfless and considers his family the ultimate beneficiaries of working with, rather than against, the site's energy. "We could have easily chosen a much more dramatic location within the property to site the shearer's quarters. It could have occupied a prominent cliff site and stated its case much more profoundly, but we wanted it to become part of an eventual four-stage wider landscape and building project, so it sits quite modestly while giving primacy to the original structure and coastal edge."

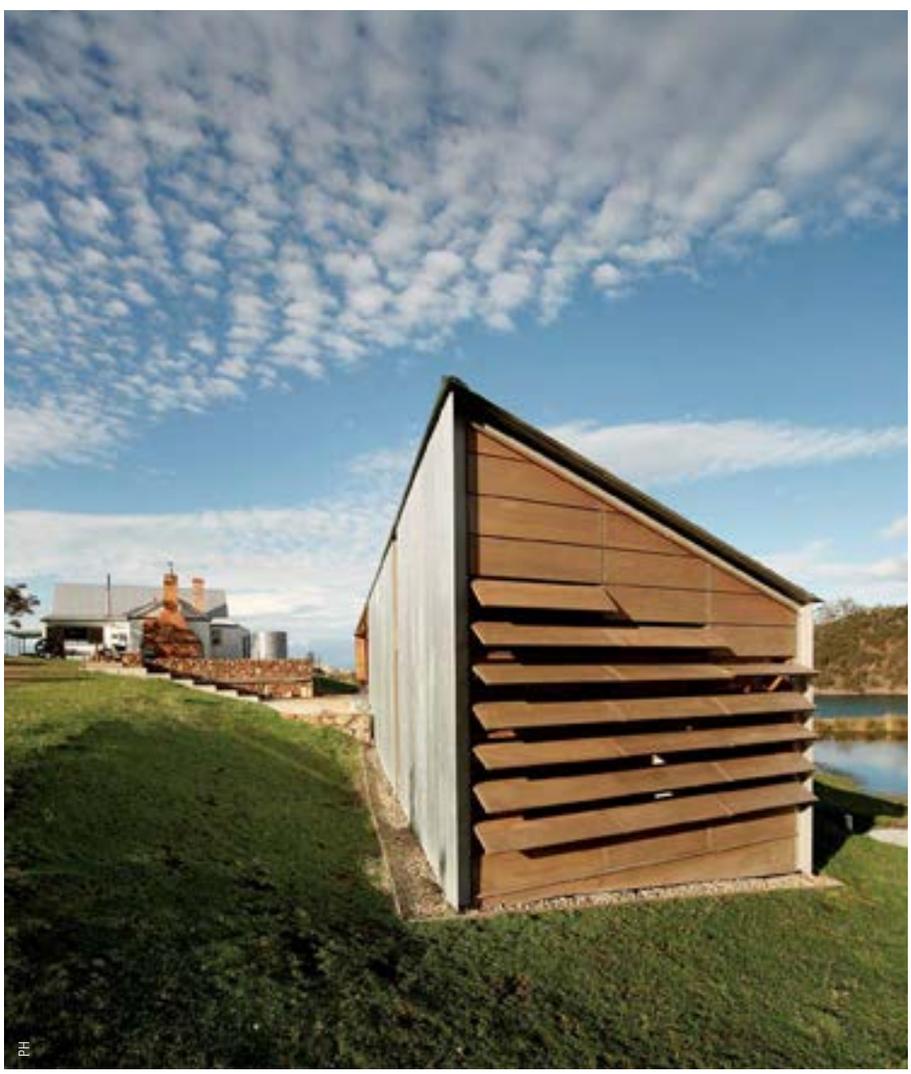
This 'masterplan' produces two primary forms that align exactly with the landfall to the south and line of the original residence along its north. A verandah inset on the northern elevation shifts alignment with the ridge to line up exactly with the verandah of the original house to the east. This transformation in plan also allows for the building to broaden at its eastern end to contain the living area and open towards the ocean view.

The plan morphs along its length to shift the profile of a slender skillion at the western end to a broad gable at the east. The geometry of this shift is carried through to the layout of internal walls, lining boards and window frames. Inside is a large open living/dining/kitchen area, bathroom and laundry, two bedrooms and a bunkroom. The primary internal lining is Pinus Macrocarpa sourced from many different suppliers principally as individual trees from old rural windbreaks. Bedrooms are lined in recycled apple box crates, sourced from the many old orchards of the Huon Valley where the timber remained stacked, but unused, since the late 1960s.

The material palette of externally applied corrugated steel establishes a convincing language and exhibits a sheen fully harmonious with a soft landscape that seems to slide inexorably into the sea. "It recalls our earlier buildings and it avoids any sense of imposition," Wardle says, keen to maintain fidelity and authenticity.

The building's modest 136m^2 footprint sees the structure nestled on the hillside for shelter from prevailing winds. Adjustable vents and louvres allow for controlled cross-ventilation during summer.

"We enjoy the fact that a project as small as this can exercise the fascination and skills of a series of people within our office and the builder's team"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Double-glazing and high performing insulation to floors, walls and ceiling reduce heat loss during the winter months.

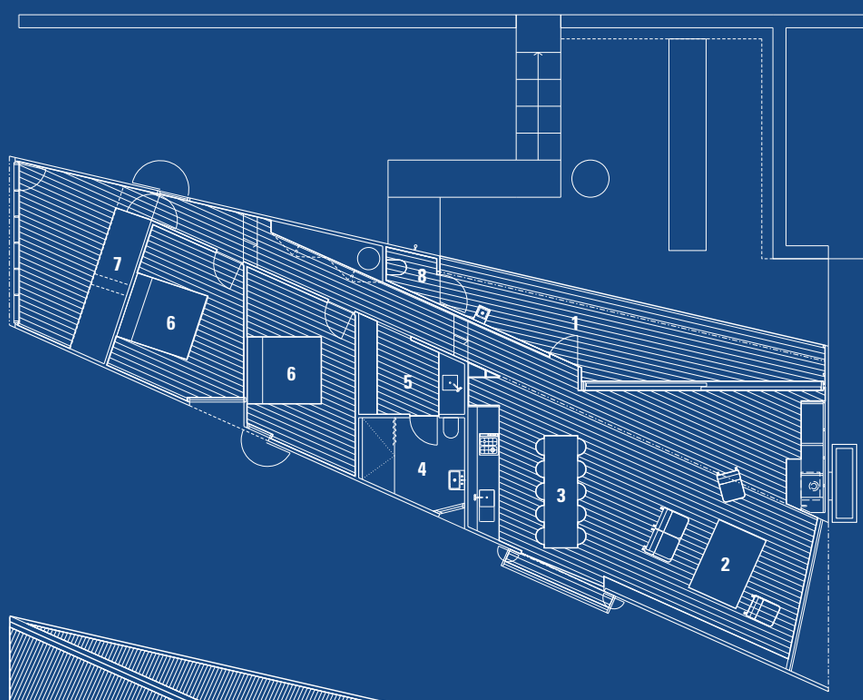
Recycled materials include original hand-made bricks for the chimney, timber flooring and the apple-box timber walls. Water is solar heated and a wood heater allows for comfortable year-round occupancy.

John Wardle is quick to share the credit, saying that, like all of the work that leaves his office, projects are never the work of one mind. What might appear to be just a shed reveals more upon closer reading. "Everyone brought something to this project. And then there was the site itself. That offers clues – the obvious ones being the history of shearing sheds and particular viewpoints and the social history of apple orchards.

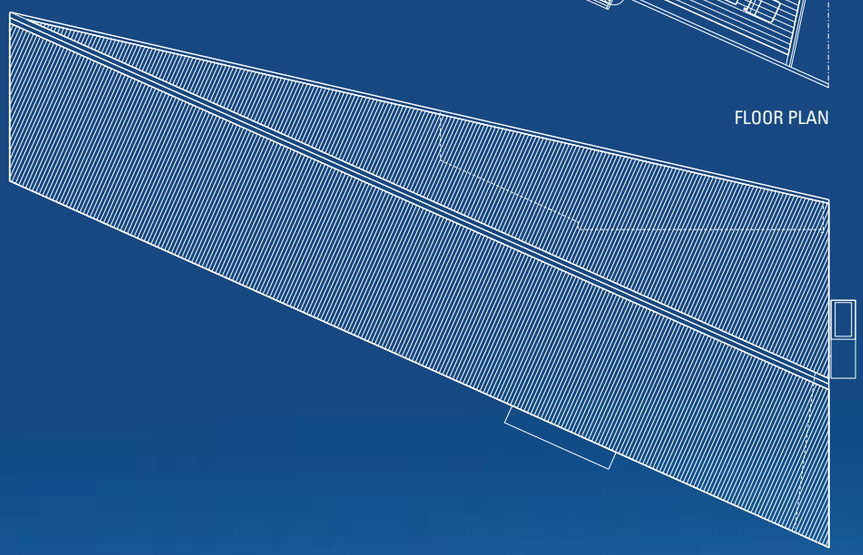
"Everyone who visits 'Waterview' expects something incredibly simple but, once inside, they understand that it's a very complex little building," Wardle says. "We enjoy the fact that a project as small as this can exercise the fascination and skills of a series of people within our office and the builder's team.

LEFT: This masterplan produces two primary forms that align exactly with the landfall to the south and line of the original residence along its north. A verandah inset on the northern elevation shifts alignment with the ridge to line up exactly with the verandah of the original house to the east

OPPOSITE: Corrugated steel establishes a convincing language and exhibits a sheen fully harmonious with a soft landscape that seems to slide inexorably into the sea



FLOOR PLAN



ROOF PLAN

LEGEND

1. Entry
2. Living
3. Dining
4. Bath
5. Laundry / scullery
6. Bedroom
7. Bunk room
8. WC
9. Kitchen garden
10. Chook shed
11. Water tanks
12. Original house

TM

RIGHT: XLERPLATE® steel is folded origami-like to achieve a virtually invisible profile for Wardle's library of vintage and classic works

BELOW and OPPOSITE: Morning light rakes in to illuminate the main living space and kitchen

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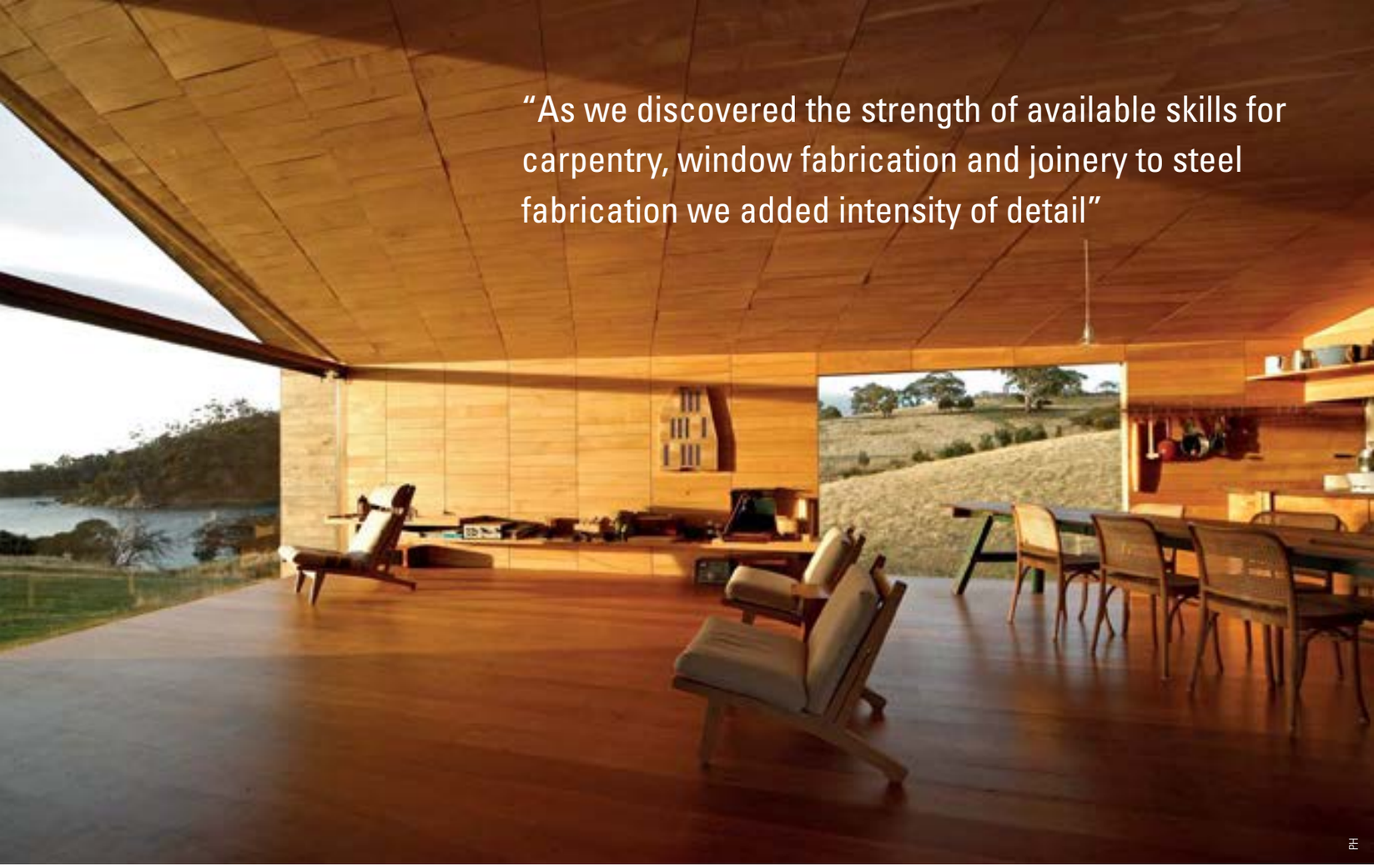


"The carpenter, for instance, has a fine arts degree and just did amazing work. The steelwork reveals a similar obsession with finish and detail.

"The out-of-form plan is pretty much as first documented. Every room dimension, door and window sit within a modular 750mm grid pronounced in the timber joints cut specially throughout the house. Everything follows this fundamental measure," says Wardle. "This accuracy is very pronounced in every detail, door and frame. As we discovered the strength of available skills for carpentry, window fabrication and joinery to steel fabrication we added intensity of detail.

"Why choose steel in such a tough environment?" Wardle asks. "Steel ages, softens beautifully and it provides such an important linkage. You might expect a shed here to be one of only two things – board and batten timber with creosote or galvanised steel. 'Gal' creates that initial impression that builds the story. It's a beautiful material that allowed us to play with direction. You can see the care taken with the direction the steel sheet runs in its precise roof alignment."

Wardle's enthusiasm for steel is explained largely on the basis of authenticity and originality.

"Its profile, texture and pattern all contribute a narrative. It also echoes a singularity of material throughout. Its geometric formula is enhanced by the nature of steel. There's this remarkable piece of steel artisanship that flows from the exterior to become the heart of the fireplace. The bookshelves' suspended steel-over-timber and timber-over-steel create a striking, complementary counterpoint. These simplest and most complex aspects of the house are rendered in steel.

"What I'm most pleased about with our practice is the breadth of reach, from small coastal houses to large residential and high-rise commercial towers, to university and research buildings."

Wardle says he has never deviated from his pursuit of architecture. Many clients will appreciate such single-mindedness for vocation. It's a blessing that brings unexpected rewards.

"I still find the intimacy of designing a small family home as rewarding an architectural experience as the power of changing the silhouette of a city skyline with a very big building, and that attitude is reflected across the practice."

His work on the Shearer's Quarters is evidence why such small craft prove every bit as powerful and satisfying as any CBD blockbuster. SP

PANEL SAYS

This accommodation for shearers and guests on architect John Wardle's family farm in Tasmania is a wonderful building that works on so many levels. It has a respectful relationship with the adjacent farmhouse, yet makes the most of its spectacular site and views, courtesy of the pointed wedge form. The exterior, clad in steel and timber, is the definition of simplicity, while the interior is a rich and warm cocoon because of its recycled timber lining and the folded steel plate joinery that gives such character to the fireplace surround and bookshelves. It's a building that plays with typologies – such as the regional pitched roof and corrugated steel skin – to stunning effect in a quiet and dignified way. No wonder it was so highly decorated at the Australian Institute of Architects awards – both Tasmanian and national – last year. We admire it for the same reasons.

PROJECT Shearer's Quarters **CLIENT** John and Susan Wardle **ARCHITECT** John Wardle **PROJECT TEAM** Andrew Wong, Chloe Lanser & Jeff Arnold **BUILDER** Cordwell Lane **STRUCTURAL ENGINEER** Gandy and Roberts **BUILDING SURVEYOR** Holdfast Consulting **WINDOW JOINERS** Hansson's Joinery **JOINERY** Euro Trend Windows & Doors **STEEL FABRICATOR** DRV Welding & Fabrication **PRINCIPAL STEEL COMPONENTS** Roofing and wall cladding: corrugated steel. Bookcase: folded steelwork made from BlueScope XLERPLATE® steel **AWARDS** 2012 Australian Institute of Architects National Architecture Awards – Robin Boyd Award for Residential Architecture, 2012 Australian Institute of Architects Tasmanian Chapter Esmond Dorney Award for Residential Architecture, COLORBOND® Award for Steel Architecture and 2012 World Architecture Festival Villa Award **BUILDING SIZE** 136m²

SHELLEY PENN

Her own varied career has given Shelley Penn insight into the myriad ways architects can contribute to a better world, so she was keen to promote diversity in her role as AIA National President. Words **Rachael Bernstone** Photography **Paul Bradshaw (portrait); Peter Clarke; Trevor Mein**

Shelley Penn is the quintessential self-employed working woman: she juggles her own architecture practice with consultancy and advisory roles in government and other agencies, and is also mother to two primary school-aged children and partner to a silversmith/academic. Oh, and they are renovating their house, for which Penn is owner-builder.

What differentiates Penn from other working women is that she has spent the past year as the National President of the Australian Institute of Architects, an unpaid role that has mostly been held by men (she's just the third woman in 80 years), and usually one who has the support of a large architectural practice behind him.

So what inspired Penn to take on this almighty challenge when she was already so busy? "I'd been involved in the Institute for many years as a member, as a chapter councillor, on state awards juries and so on," she explains, "and in 2009 I was asked to put my hand up to run for national council".

After two years as National Honorary Secretary, Penn was asked to consider running for President.

The Fitzroy Terrace (1997) features Penn's signature steel-framed windows and doors PC

"Something common to all my projects is thinking about how spaces connect and about the passage or journey. The use of natural light, and an overarching simplicity, are important to how the spaces flow and work"

"I thought, 'that's a lot of work', but I saw it as an honour and an opportunity to try to inspire others, especially women and sole practitioners."

As her year draws to a close, she admits it has been hectic. Even still, the opportunity to tour Australia and meet architects around the country was one of the highlights, she says. "I went to each state and territory for the Architecture Awards, and it was fantastic to see the diversity of work and to meet members and hear about their issues first-hand," she recalls.

"They're our shareholders and they are a very broad group," she adds. "In terms of scale, it's important to make sure the voices of small practices are heard because it's often the case that architects in bigger practices are more readily available to contribute to the Institute.

"We also need to balance regional versus urban concerns, understand the impacts of gender differences, and different modes of practice," she continues.

As a teenager Penn loved maths and literature, and settled on architecture as a way to combine problem-solving with the humanities and creativity. But her interest in architecture was wavering as she concluded her third year of study.

"I was incredibly lucky to go on a trip to Japan, and was really inspired by traditional and contemporary Japanese architecture," she says. "Then, in my final years of study and beyond I worked for Robinson Chen. I attribute my 'switching on' to architecture to those two experiences.

"Robinson Chen built many of its own projects so the office did a lot of work related to construction as well as design. We did not do so much in the traditional administrative role," she says, "but more work directly with people on site".

That model has flowed into her own practice, which she established in Melbourne in 1993. Penn is mainly known for her finely crafted residential projects – a mix of alterations and additions, and new houses – and says that rather than trying to create an overriding aesthetic, she responds to each project's constraints and opportunities individually.

"Something common to all my projects is thinking about how spaces connect and about the passage or journey," she says. "The use of natural light, and an overarching simplicity, are important to how the spaces flow and work. I would much rather have plain bench tops and a beautiful volume than gold leaf and no sense of space, for example," she explains.

An element that regularly appears in Penn's projects is steel windows and doors. "They were present in my first project in 1994 – a conversion of a brick 'box' warehouse with 1940s steel windows – where I added a deck within the 'box' and wanted a fluid relationship to the interior," she says. "A wall of steel-framed windows acted almost as a screen, with minimal intrusion on the flow of space. I've used them in most of my projects since then. The steel frames are both strong and very fine, and you can play with composition."

Penn always uses steel roofing and has clad several projects in steel, including another warehouse conversion in Richmond (1999), alterations to a terrace house in Fitzroy (1997), a house in Potts Point in Sydney (with Clinton Murray, 2001) and a new build at Port Fairy (also with Clinton Murray, 2006) on Victoria's south-west coast.

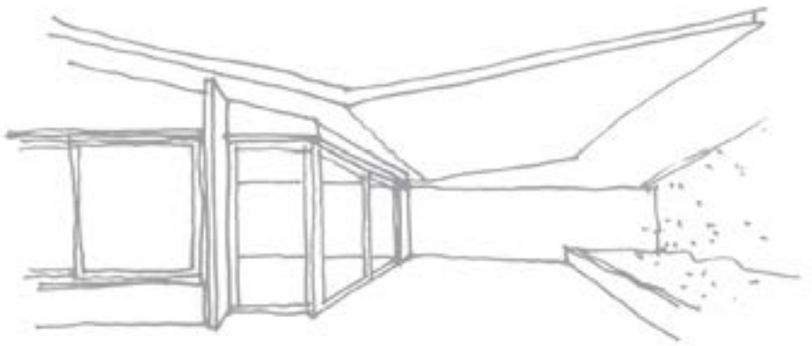
At her own home in the seaside village of Williamstown, Penn's silversmith partner Mark Edgoose is making the steel windows to her design for their renovation, and at another current project (in Brighton) she has incorporated expressed structural steel in the roof form and expressed parallel flange channels (PFCs) along the roof edge to create a folded floating plane that responds to the heavier mass of the original house.

"I've also used steel as a finish – folded galvanised sheet for cladding and mild steel for steps and benchtops, shelving and joinery. Mild steel is very beautiful. It adds warmth and richness, but while timber and stone are thick, steel can be very fine, slender or flat. These are not new ideas – many architects have used steel in these ways for years – just look at Pierre Chareau in the 1930s."

When Penn moved to Sydney in 1999, she was questioning her career direction and the value of small projects – she wondered if that type of work was likely to change the world. She was invited by Chris Johnson to join the NSW Government Architect's Office as Design Director and spent almost two years in that role, with a focus on large scale urban and public projects. She continued collaborating on residential projects with other architects, and also

THIS PAGE: The Richmond Warehouse conversion (1999) used galvanised steel as a cladding material outside (above) and blurred lines between inside and out with a large steel-framed pivot door (right)

"It's really important that we think about how we practice, and what people produce from practice, because there are some challenges around what we think of as 'credible' architects"



LEFT: The Brighton House, currently under construction, will feature expressed structural steel in the roof form and PFCs along the roof edge to create a folded floating plane, responding to the heavier mass of the original house

ABOVE: Also currently being renovated, Penn's own house at Williamstown will incorporate steel-framed windows into her design, made by her partner, silversmith Mark Edgoose

had her first child, before returning to Melbourne in late 2002. From that time, Penn combined government consultancy on large projects with her sole practice, and had her second child in 2004.

When the Victorian Government announced in 2005 that it would establish the Office of the Victorian Government Architect, she applied and was appointed Associate Victorian Government Architect, alongside John Denton. Since leaving there in 2010, Penn has advised state and local governments while consulting on other major projects. She currently chairs the National Capital Authority, the statutory body charged with strategic planning, promotion, development and enhancement of Canberra as the National Capital.

Working in the Office of the Victorian Government Architect, within the Department of Premier and Cabinet, provided an excellent opportunity to advocate for design quality, an objective that Penn has continued to champion in all aspects of her career.

Her experiences of working at the drawing board and in the boardroom have provided Penn with a great understanding of how architects and architecture fit into a shifting landscape, and how they might be forced to respond and adapt to new procurement and delivery models.

"The role of architecture is changing, because procurement and contract forms are changing," she says. "There are not so many traditional lump sum contracts in large commercial projects any more. Novation is more the norm at that scale, and so we need to look at how to protect design quality for the end user. That is much harder when you work for the builder, and it's a big issue for the whole profession."

Her experience of being a mother – taking time out of practice to raise children, and juggling work commitments with family life – has helped her understand the need for architects of both genders to think about new ways of working that don't rely on a combination of long hours, low wages and inflexible working conditions to succeed.

"It's really important that we think about how we practice, and what people produce from practice, because there are some challenges around what we think of as 'credible' architects," she says. "We're still stuck a bit with the image of the 'hero' architect who works 24/7 and produces masterpieces, whereas in fact a lot of excellent architects do all sorts of other things – like working in academia training young architects, enhancing the lives of disadvantaged people by improving housing at a very fundamental level, or working in government helping them to be an 'intelligent client' – and that kind of work doesn't get applauded as much as it should within the architectural community. Also, you can produce exceptional work whether you work full-time or part-time.

"The issue of credibility being tied to long hours is particularly relevant when you look at women, who are usually the primary carers of children. It's also becoming more of an issue for men," she adds. "It's not really possible to work full-time if you are the primary carer of children, and so women can feel they're seen as being less committed, or 'not serious'. I think that's just rubbish, but it's a tangible issue for many women I know and have heard from in this role.

"I want to highlight that there are many diverse ways of making an important contribution as an architect, and many ways of practising," Penn continues.

Penn says she didn't become President to particularly champion women's issues, but the need was so pressing that she "felt it had to be done". Now on the cusp of handing over to president-elect Paul Berkemeier, she is keen to focus on her other concerns, big and small.

"There is the ongoing battle of communicating the value of architecture – that it is not superfluous or an indulgence, but that it's about the fundamentals of well-being and sustainability for society as a whole," she says. "It's also about culture, inspiration and delight in our daily lives. Since 2000, I've been doing a mix of things, and I don't want to take anything for granted or as a given. I'm testing my levels of tenacity in relation to small practice, and whether I can maintain enough focus to do good work, while also pursuing my mix of other interests – public policy, governance, my family, as well as a few other things I want to do." **SP**

CAMPING CYLINDRICAL

Designer Simon Laws has created a 'campsite' typology for a cluster of steel-clad pavilions, influenced by the childhood experiences of sugar mills and beaches of the owner, artist Marian Drew.

Words **Margie Fraser** Photography **Alex Chomicz**

DESIGNER & BUILDER Anthill Constructions
PROJECT Drew House
LOCATION Sunrise at 1770, Queensland

The living space is encapsulated in a steel cylinder with a louvred timber window at the end for ventilation

BELOW: Looking into the kitchen from the northern deck

Outdoor living is on a timber deck under the swooping roof

The kitchen sits at the western end of the cylinder, with the lounge area on the eastern end

Simon Laws is a long way from the idyllic site of the beach house he designed on Queensland's mid-coast when we chat about it on Skype. He is instead in a far-flung province of China or, as he notes between sneezes and sniffles, "at the epicenter of bird flu territory", where he is designing and building transportable dormitories for workers. So thematically, or at least materially, there is a connection to the beach house he designed earlier for artist Marian Drew and her brother Derek.

The cluster of steel pavilions sits on a forested dune above the beach in the gated estate of Sunrise at 1770, south of Gladstone. In its dispersal of separate dwellings it is reminiscent of a campsite, and contrasts with some of its more grandiose neighbours in the enclave. A few kilometres to the north, the towns of 1770 and Agnes Water also boast a knockabout feel that recalls holidays when needs were more rudimentary and nature took precedence over the human-made.

In the design of their beach house, the Drew siblings were keen to emulate childhood holidays spent camping in the region. "Marian and Derek had a strong connection to the site already," says Laws. "It was clear from the start that we were to capture the feel of a campsite, but things then developed organically from our first visit there together."

For Marian and Derek, it was a day of both nostalgia and sadness when they took Laws, a long-time friend, on the 500 kilometre drive north from Brisbane to Sunrise, and dropped into their childhood home along the way. 'Fairymede' was a sugar cane mill and processing plant outside Bundaberg that housed enough staff to operate as a small village. The Drews, whose father was the chief electrician for the plant, grew up and went to school there. When the trio popped in to refresh memories, they found it in the process of being demolished.

"It was a powerful day," recalls Laws. "Everything was being broken up and torn apart. We tried to look at the mill but were chased away by security. There were amazing shapes to be seen everywhere – these big boilers and cane-cutting machines and turbines – all being dismantled."

Something of the fragmented steel structures is apparent in the Drew house, where a long tube of rolled corrugated steel – specifically CUSTOM ORB® profile made from COLORBOND® steel in the colour Surfmist® – serves as the living zone and base station for the home.

"This steel is so rollable – it's like an old bangle really. It is light, and durable – you just throw it into the ute with the roller," says Laws. "The soft grey 'Surfmist' colour is also perfect in the bright sunshine. It blends with the surrounding bush of banksias, casuarinas and palms."

In its dispersal of separate dwellings it is reminiscent of a campsite, and contrasts with some of its more grandiose neighbours in the enclave

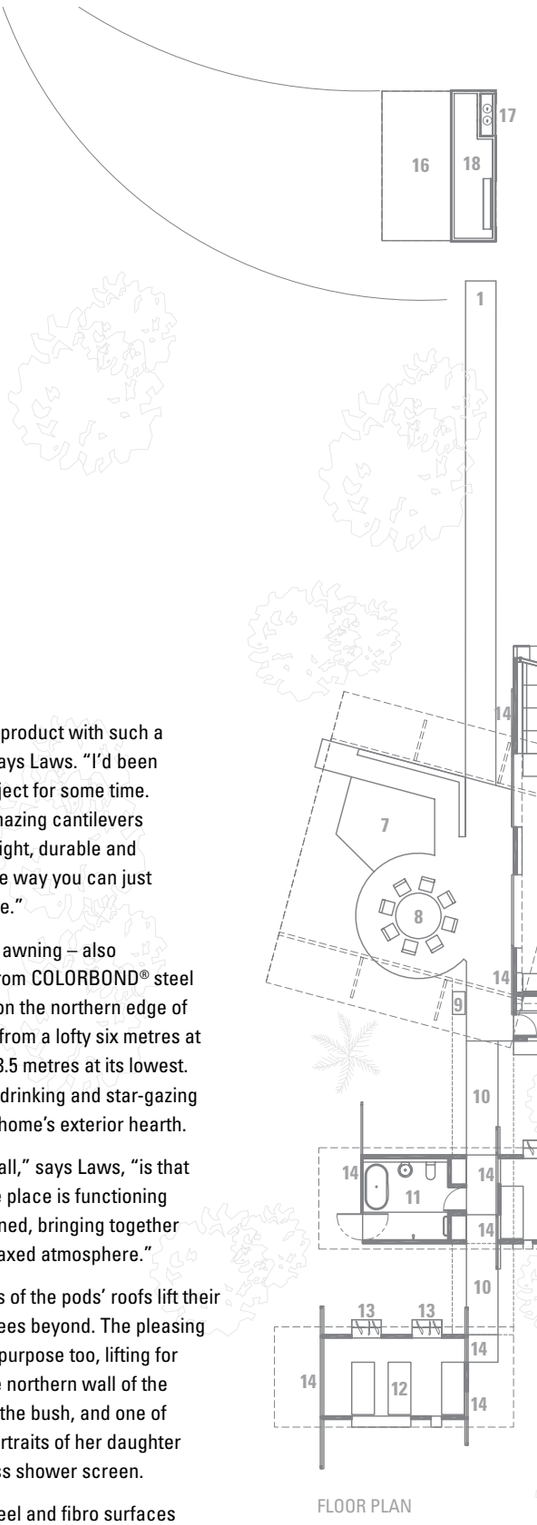
PANEL SAYS

This project provoked wide-ranging responses, with some panellists loving it and others being not so enamoured. As a retreat for an artist and her family, it was designed to be out of the ordinary, and the result is an inspiring place in which to relax and unwind. The cluster of living and sleeping quarters set around outdoor covered rooms connects the occupants intimately to the landscape, and demands they become involved with the outdoors and elements. It has a quintessentially Australian flavour that we (mostly) appreciate, thanks to the big steel roofs that have both practical and poetic attributes – as well as maximising the collection of rainwater and providing shelter from the sun, while the slight twist in the roof profile is reminiscent of a bird's wing. It's whimsical and playful and a little bit frivolous – the perfect place to enjoy a holiday by the beach.

TOP: Bedroom and bathroom pods are constructed with fibrous cement sheeting, and connected by a timber bridge hovering above the ground

ABOVE: A double layer of doors opens the bathroom wall to the northern sun. A pivoting shower screen uses one of Drew's photographic portraits for privacy

The exuberant, zig-zagging roof profile twists and lifts on the pods in opposing pagoda-like parabolas



FLOOR PLAN

LEGEND
1. Entry walkway
2. Lounge
3. Kitchen
4. Pantry
5. Laundry
6. WC
7. Outdoor lounge
8. Outdoor dining
9. BBQ & bench
10. Covered walkway ramp
11. Bathroom
12. Bedroom
13. Robe unit
14. Sliding joinery
15. Louvres
16. Carport
17. Gas/bins/meter box
18. Store room

Locals refer to the extruded cylinder living space with its propeller-like louvred window end as 'the plane crash'. The nickname, Laws notes, shows the best and worst of the Australian character in its deeply reactionary attitude expressed through laconic, derisive humour. What the joke doesn't comprehend, though, is the high level of finish inside the shell, nor the careful placement of the piece to take part in the pleasures of the site in terms of ventilation, light and breezes. This is no random, abandoned steel missile.

With a six-hour drive between the Gold Coast factory and its final destination, it was important to use lightweight, practical materials that were durable as well as being easy to assemble once on site.

Laws recalls a nervous drive north behind the transport truck as all the home's components made the journey up the Bruce Highway. They arrived intact, and the prefabricated trusses were easily erected before bad weather set in. A tarpaulin slung between the trusses became the builders' protection from rain for four of the six weeks it took to build.

"We built the deck under cover, and built the sleeping pods early on so that the place was immediately functional," says Laws.

The two sleeping pods and the bathing pod are connected to the main living pavilion by a timber bridge that forms a central spine to the complex, hovering a metre above the sandy ground.

Their toothy, textured fibrous facades ("a nice link to the traditional weekender," says Laws) are crowned with quirky, tilting roofs. The exuberant, zig-zagging roof is ARAMAX® profile made from from COLORBOND® steel in the colour Surfmist® which twists and lifts on the pods in opposing pagoda-like parabolas.

"ARAMAX® is a fantastic product with such a big spanning capacity," says Laws. "I'd been wanting to use it on a project for some time. You can achieve these amazing cantilevers and spans in profile. It is light, durable and such good value. I love the way you can just spit out lengths of it on site."

The elegant swoop of the awning – also ARAMAX® profile made from COLORBOND® steel in the colour Surfmist® – on the northern edge of the living room tube sails from a lofty six metres at its highest point down to 3.5 metres at its lowest. Underneath, dining, wine drinking and star-gazing all take place around the home's exterior hearth.

"The really nice part of it all," says Laws, "is that Marian and Derek say the place is functioning exactly as they had imagined, bringing together family and friends in a relaxed atmosphere."

The gently twisting curves of the pods' roofs lift their corners to look into the trees beyond. The pleasing aesthetic has a practical purpose too, lifting for increased ventilation. The northern wall of the bathing pavilion opens to the bush, and one of Marian's photographic portraits of her daughter is emblazoned on the glass shower screen.

While the colour of the steel and fibro surfaces disintegrate and blend with the greys of the surrounding bush, richly stained timber doors and floors mimic the redness of the giant bloodwoods. And when the summer storms hit, the sound of rain drumming on tin recalls another magic moment from childhood. SP

PROJECT Drew House **CLIENT** Marian Drew and Derek Drew **ARCHITECT** Simon Laws **STRUCTURAL & CIVIL ENGINEER** Knight Consulting **BUILDER, STEEL FABRICATOR, SHOP DRAWING CONTRACTOR, CLADDING CONTRACTOR AND LANDSCAPE ARCHITECTS** Anthill Constructions **PRINCIPAL STEEL COMPONENTS** Curved roof/walls: CUSTOM ORB® profile made from COLORBOND® steel in the colour Surfmist®; Canopy and pavilion roofing: ARAMAX® profile made from COLORBOND® steel in the colour Surfmist® **PROJECT TIMEFRAME** 10 months **BUILDING SIZE** 120m² (interior) 100m² (exterior)

SUBURBAN EMBRACE

A sweeping gesture by MGS Architects aimed to embed this new social housing project in its surroundings while creating a vibrant community for residents.

Words **Rachael Bernstone** Photography **Paul Bradshaw; Trevor Mein**

ARCHITECT MGS Architects
PROJECT McIntyre Drive Social Housing
LOCATION Altona, Victoria

"We made an animation that illustrated our thinking, which showed two arms bringing the surrounding single storey residences into the site"

ABOVE: The development wraps around a courtyard, and the facade is articulated by house-sized modules that reference the surrounding single-storey homes

RIGHT: The main entrance is set back behind a driveway, lined with existing trees, using the footprint of the nursing home that previously occupied the site

In a suburban neighbourhood characterised by single-storey family homes – mostly brick or weatherboard houses with tile roofs – a three-storey apartment complex had the potential to throb like a sore thumb. Fittingly, project director Eli Giannini of MGS architects uses a gesture of sweeping hands and enclosing arms to describe the genesis of her design.

"We made an animation that illustrated our thinking, which showed two arms bringing the surrounding single storey residences into the site," she explains. "That allowed us to take all that typology of the suburb – single-fronted homes and pitched roofs – and bring that sense of home into this development, to reflect the individuality of all those houses.

"The gesture of doing this," she demonstrates by outstretching her arms and bringing them together, as if collecting an assortment of dwellings into one messy pile, "and then providing the contrast of a rectilinear facade on the exterior against the gooey, soft, articulated centre was the basic concept of the scheme".

The new building's form, footprint and height mimic the size and shape of a nursing home that previously stood on the site. That three-storey U-shaped building wrapped around a central courtyard, and was set back from the road behind a curved driveway and row of established trees. Inside, it was characterised by small bedrooms, shared bathrooms, long corridors and low ceilings, Giannini recalls.

The facility was empty and disused by the time MGS won this project, part of the Social Housing Initiative through the Commonwealth Government's Nation Building economic stimulus plan, in 2009.

The brief was for 69 one-bedroom apartments over three floors, and, in accordance with Victoria's Department of Human Services objectives, it also stipulated indoor and outdoor communal spaces, community gardens, private open space and disability access provisions.

Giannini says that the decision to maintain the existing access and mature gumtrees was made early, so that the courtyard form was self-evident from the outset.

"As soon as we went there, we knew we needed to preserve the driveway and the trees, because the site had a very nice relationship to the street," she says. "The yield had to be increased to make the best use of the land, but we wanted to maintain the interface with the neighbours to demonstrate that we were not muscling in on their territory."

On the southern boundary, where the site abuts the backyards of neighbouring houses, Giannini opted to maintain the generous 30-metre setbacks of the original nursing home by installing additional disabled car parking spaces along the fence line. She also dropped the height of the structures closest to neighbours to one or two storeys to minimise overshadowing and overlooking, and raised the balconies on the southern elevation to increase privacy.

ABOVE: The 'house' forms are delineated with a combination of LYSAGHT LONGLINE 305® profile made from COLORBOND® steel in the colours Woodland Grey® and Monument®, and timber cladding

BELOW: Trees on the northern boundary were preserved, and protected balconies offer a relationship with the canopy

"There were a couple of other large trees on the eastern boundary that we wanted to preserve, so the design worked around those and along the northern boundary – which overlooks a council reserve – we included protected balconies that enjoy the dappled light and a relationship with the tree tops," she adds. "It was all about making the most of what was already there."

Having established the courtyard form, Giannini says the design came together quite quickly, with the development of the facades being the next priority. "This is a new typology in a sense because it's a hybrid between a three-storey suburban apartment development – which is what the outer edge looks like – and internally where the courtyard resembles houses stacked on each other," Giannini says. "There are living room and bedroom modules – two room types – arranged in a variety of ways."

That distinction called for a different application of materials inside the courtyard – where the 'house' forms are delineated through a combination of LYSAGHT LONGLINE 305® profile made from COLORBOND® steel in the colours Woodland Grey® and Monument®, and timber cladding. The outside edges feature vertical bands of cladding made from COLORBOND® steel and timber cladding in the middle sections bookended by steel-clad boxes at the corners made from COLORBOND® steel, with perforated aluminium balconies set within steel frames punctuating the facade at regular intervals. The roof is a combination of LYSAGHT KLIP-LOK 700® profile made from COLORBOND® steel in the colour Windspray® and LYSAGHT LONGLINE 305® profile made from COLORBOND® steel in the colours Woodland Grey® and Monument®.

"Because the apartments are all a uniform size, we were able to match or mirror the floor plan, which was then flipped from floor to floor, to get a more irregular reading of the facade in the courtyard," Giannini says. "We played around with the steel and timber contrasts, and then chose bright colours within the reveals to contrast against the darker steel."

That bold use of colour from the facade continues internally to create uplifting and inspiring common areas. The main foyer boasts a double-height space where multi-coloured glass windows cast patterns on the floor like stained glass in a cathedral. The double-loaded corridors and common areas upstairs – far from being dreary or depressing places – have boldly striped carpet and huge windows that fill the hallways with natural light and offer glimpses of the sky through majestic trees.

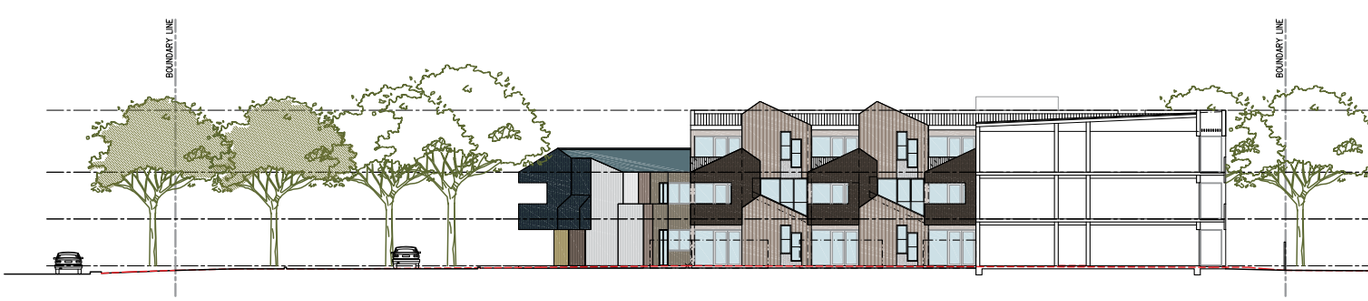
For the wall cladding Giannini says she specifically chose the LYSAGHT LONGLINE 305® profile made from COLORBOND® steel for its bold ribs and wide pans. "I like the chiaroscuro effect of the deep-ribbed profile which is very precise and offers the potential for that crisp edge to happen. I also love the dark colours – there are a lot of beautiful colours in the darker range – and I wanted the subtlety of the darker colours to work with each other in the courtyard overall, and to contrast with the brighter and softer colours inside the eaves."

Another advantage of specifying steel roofing and cladding was its contribution to an accelerated construction program. "One of the interesting aspects of working with steel cladding is that it enables you to build using reverse brick veneer, or in this case, building internal walls of precast concrete," Giannini says.

On the southern boundary – closest to neighbouring houses – Giannini dropped the building's height to two storeys to minimise overshadowing and overlooking, and raised the balconies to increase privacy

"This is a new typology in a sense because it's a hybrid between a three-storey suburban apartment development – which is what the outer edge looks like – and internally where the courtyard resembles houses stacked on each other"

COURTYARD ELEVATION – FACING SOUTH



COURTYARD ELEVATION – FACING NORTH

LEVEL 1 FLOOR PLAN

PANEL SAYS

It's extremely hard to produce interesting-looking multi-unit housing using steel, so this project is well and truly out of the box. It contributes to an intriguing and interesting streetscape through references to the small-scale development of the surrounding neighbourhood – qualities which may help it to set a future character for the area. Like all social housing projects – which demand long life, low maintenance buildings on low budgets – this one does much with little, but transcends those constraints to achieve a playful and celebratory architecture that has the capacity to bring joy to the residents lucky enough to live there.

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In the main foyer, multi-coloured glass windows cast patterns on the floor like stained glass in a cathedral

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"That made the project quick to build because once we got to precast section it really sped up. There was a lot of precast to be installed so it was done in sections, but the builders were able to commence work on the interiors before the external steel and timber cladding was installed, because the building was basically watertight already."

The level of precision that was required to install the steel cladding as she envisaged provided Giannini with a welcome opportunity to engage with the builders in discussions about detailing. "Contractors are used to doing things in a certain way, and these sorts of products require precise set-outs because they need to be placed in such a way that the pattern is regular, otherwise you end up with a great big flashing at one end and a short one at the other," she explains. "I've done this sort of thing before. On a house about 15 years ago we used the old Brownbuilt 305 profile in a similar way to this with the fine details around the window edges and so on. I had faith that this would work in similar ways.

"I really enjoyed having a conversation about the materials with the subcontractors," she continues. "We had discussions about tricky corners where the roof comes down and becomes wall and then folds back in again," she says.

"It could have ended up looking clunky but they created fine edges that are robust and waterproof. It was quite a tricky project for the steel roofing contractors but those guys were very skilled and got the picture straight away."

Because of the shifting forms that make up the courtyard elevations, and the mix of public and private outdoor spaces within it, the project boasts a European feel. The intimate scale fosters interaction among the tenants, which has been enhanced through the provision of communal barbecues and shared garden beds where tenants can grow flowers and food.

"All of the ground floor units were designed so that their private open space has a high and low picket fence, so they can talk to the people in the courtyard if they want to," Giannini says. There is also a community meeting room on the ground floor, accessed directly from the courtyard and via the main foyer, where residents can meet with support workers or gather socially.

The project was initially intended to accommodate people with disabilities so the entire ground floor – indoors and out – is accessible, while the upper floor apartments have generously sized bathrooms and kitchens with units on castors that can be moved around as required. The project is being managed by Yarra Community Housing (YCH), which receives disabled tenant referrals from Western Regional Health, resulting in a tenant mix of couples and single people aged over 50, who are entitled to live there indefinitely.

"We designed all of the units to be adaptable for ageing in place, and included other gestures such as the undercover seating outside the gate, so that for example people can sit under shelter while they are waiting to be collected by a friend," Giannini says.

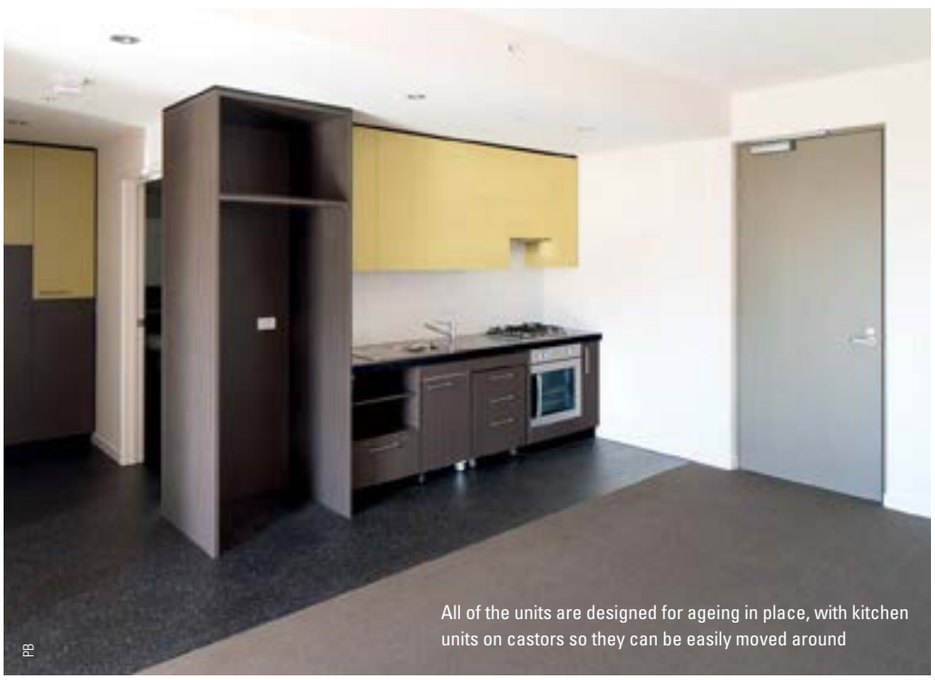
According to YCH Asset Manager Paul Ryan, the McIntyre Drive apartments compare favourably with the more than 550 other properties under YCH management, most of which are smaller and don't have dedicated outdoor spaces as a standard inclusion.

"The tenants have told me that they feel like they have hit the jackpot," Giannini says. "I've had people tell me: 'Obviously there has been some really great care taken in this building,' and that's really gratifying to hear.

"They've told me they find the use of colour very cheerful, they like the fact that the facade is articulated which means they don't feel like they are living in a bland box," she continues. "They like the sense of space – the fact they have a generous living space and their own outdoor space."

Giannini and her colleagues collected some feedback from residents about their new digs after people moved in last November, and apart from a few niggles about defects, it was largely positive. One of them, Bob, said: "The first day I moved in I said 'this is the first day of my new life'. It's more than I anticipated, more in every way." Another, Gloria, who lives in one of the units with her two pet dogs, said: "It's very quiet in your room and the bathrooms are huge. My girls and I are lucky." SP

"I like the chiaroscuro effect of the deep-ribbed profile which is very precise and offers the potential for that crisp edge to happen. I also love the dark colours – there are a lot of beautiful colours in the darker range"



All of the units are designed for ageing in place, with kitchen units on castors so they can be easily moved around

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PROJECT McIntyre Drive Social Housing **CLIENT** Victorian Department of Human Services **ARCHITECT** MGS Architects **PROJECT TEAM** Design Principal: Eli Giannini; Design Team: Sue Buchanan, Babak Kahvazadeh, Catherine Ranger, Ganga Ratnayake, Sheri Haby, Bernard Toogood, Rilla Healey, with Dyskors (Ed Carter schematic stage) **LANDSCAPE ARCHITECTS** GHD Australia **STRUCTURAL** Robert Bird Group **CIVIL ENGINEER** Cardno **SERVICES ENGINEER** Jeff Bryar and Associates **BUILDER** Kane Constructions **STRUCTURAL STEEL FABRICATOR** R&M Engineering **STEEL SHOP DRAWING CONTRACTOR** SRC Drafting **METAL CLADDING CONTRACTOR** PBR Roofing **PRINCIPAL STEEL COMPONENTS** Racked roof and wall cladding: LYSAGHT LONGLINE 305® profile made from COLORBOND® steel in the colours Woodland Grey® and Monument®; Flat roof: LYSAGHT KLIP-LOK 700® profile made from COLORBOND® steel in the colour Windspray®; SHS balcony frames **PROJECT TIMEFRAME** 13 months (construction) **AWARDS** 2013 Australian Institute of Architects Victoria, Best Overend Award for Residential Architecture – Multiple Housing **BUILDING SIZE** 5700m² on three floors **PROJECT COST** $14 million – $2450 per square metre (including site and landscape)

Born in response to a natural disaster, an inventive steel emergency housing solution by Carterwilliamson Architects also brims with potential as permanent low-cost housing. Words **Rob Gillam**

Photography **Paul Bradshaw; Brett Boardman**

FIRST AID KIT

ARCHITECT Carterwilliamson Architects
PROJECT Grid Shelter
LOCATION South Nowra, New South Wales (manufactured)

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the structure. “In emergency situations the ground isn’t going to be properly prepared so the ability to adjust the height of each acrow-prop leg makes them ideally suited to uneven terrain,” Carter says.

The building is relatively lightweight and needed minimal support, so even an unintended device such as an acrow-prop proved suitable as a vertical column.

“It also allows for ‘on-the-fly’ fine adjustment to account for settlement. We can deal with a one-in-five slope. So we’ve got a one metre adjustment over five metres, which is pretty steep. Even with the weight of the whole building it’s quite easy. You just turn a nut.”

Depending on the size of a construction team and their experience, Grid can literally be built in a few hours, as was demonstrated in Martin Place as part of the Sydney Architecture Festival in 2012. Carter says that with a team of seven people it took 3.5 hours to erect and the same to disassemble. “With more people and more experience it could be an hour less,” he adds.

A single experienced ‘leader’ can guide a team of inexperienced labourers but in an emergency situation he foresees a ‘leader’ training a wider group to exponentially grow the amount of labour skilled in the construction. “Labour isn’t short in a disaster. Most people survive and need something to do. With a team leader you can train a group. With 10 groups of 10 people, each putting up two Grids per day, you can build 20 houses daily.”

Carter likens Grid’s modular assembly to that of an oversized Ikea project. “It’s prefabricated so it arrives as a flat-pack. Everything’s pre-drilled and there’s no need for any specialist equipment or tools. It comes with two cordless drills, four charged batteries and a pack of screws.

“At about 1.7 tonnes the building’s not very heavy, but the wall panels weigh around 150 kilograms, which requires a couple of people to hold them in place for fixing. Once you get the plate down and the legs up, you basically just screw everything together.”

Boxing Day, 2004: a 9.0 magnitude earthquake – the highest reading on the richter scale – struck near the Indonesian island of Sumatra, unleashing one of history’s deadliest natural disasters.

Some of the worst damage from the resulting Indian Ocean tsunami happened in the northern Sumatran province of Aceh, in which the United Nations reported over 130,000 fatalities. Half-a-million people were displaced from homes destroyed by the surging sea.

Watching the disaster from afar, architect Shaun Carter was dismayed by the devastation left in the tsunami’s wake. “Neighbourhoods in coastal areas were swept away, leaving behind extensive rubble,” says Carter. “I watched the tents go down for emergency relief but the troubling thing was that there didn’t seem to be a long-term plan.

“The problem with tents, especially in post tsunami-affected areas, is that you’re already off to a bad start with the debris and water on the ground. It collects around them, they deteriorate and water-borne disease sets in.

“My thoughts turned to a better emergency housing solution. I thought about it broadly, in a loose way. It’s a process we apply to every project we take on: you have constraints and you design around them. In this instance, the key questions were: ‘How can we get it out of the ground? How can we get it down quickly, and cheaply?’.”

A cornerstone of Carter’s design is the ingenious adaption of a device conventionally used in concrete form working.

“A solution for getting it quickly off the ground was paramount. I was on a construction site one day, leaning on an acrow-prop and I thought: ‘If I turned this upside-down, it would be perfect’.”

The telescopic steel tubes traditionally used to support scaffolding act as vertical columns at each corner of

“Steel’s impenetrability adds to the sense of security and shelter”

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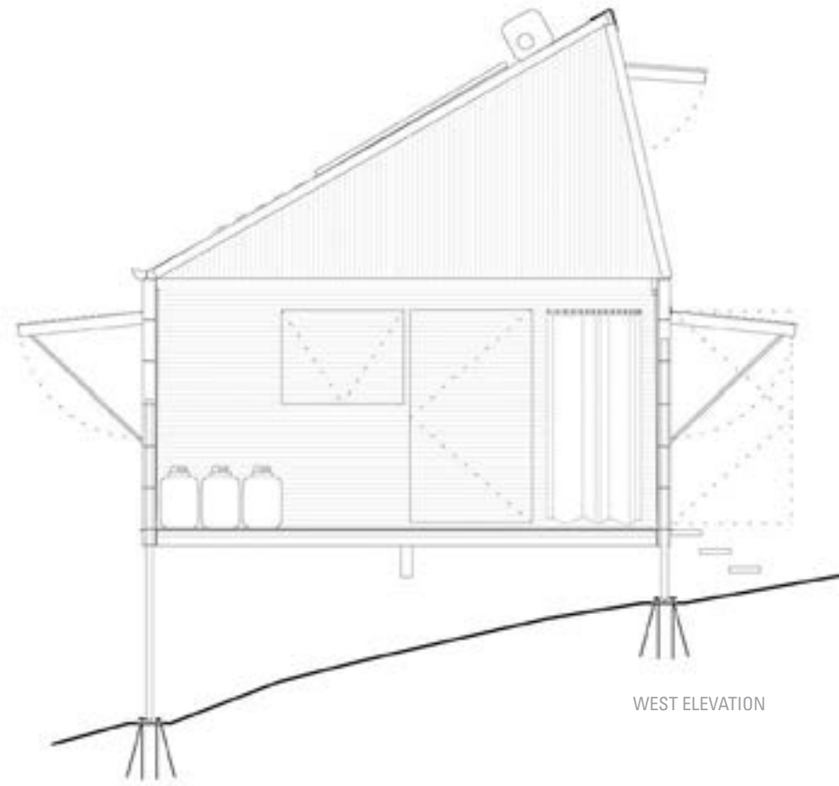

WEST ELEVATION

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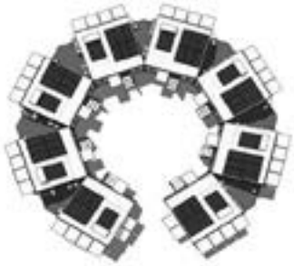
ABOVE: Although pragmatic by design, the architects achieved a resolved design for Grid through material singularity and the homely imagery of a pitched roof

FAR LEFT: Avoiding potential interior compromise in case of failure, ancillaries including rainwater tanks, PV cell, gas bottles, shower and toilet are housed on external 'outriggers'

LEFT: Mezzanine sleeping quarters provide spacial differentiation in the plywood-lined interior. Inverted acrow-props serve as vertical columns and adjust easily over uneven terrain



PANEL SAYS

This "caravan without wheels" is an extremely worthy type of disaster shelter, which can be deployed in a remarkably short timeframe to provide housing after an emergency. While it presents as a very utilitarian object, it has plenty of architectural merit and provides maximum amenity in a minimal footprint. The architects have carefully considered the associated issues of fabrication, transportation and assembly, making this a very well-resolved solution. We can also see applications in the temporary accommodation sector, where the Grid could provide a cost-effective but much more advanced housing option than the standard modular unit or "donga" found at many remote locations.

"We're quite likely to be the only people to have slept in their own house in Martin Place"

Envisaging that its occupants would be mostly self-reliant, Carter designed Grid to be comprehensible in case of failure. "We wanted to keep the design simple so that the construction method would also be simple. If a wall panel fell out, you would realise it uses standard construction. None of the members span very far before they have another connection, so even someone without structural experience could diagnose and repair it quite easily."

The Grid 'flat-pack' comprises 11 prefabricated panels based on a 2.4 by 4.8-metre module.

Each component – whether as wall, roof or floor – is an interconnecting structural member comprised of corrugated steel cladding, insulation and interior plywood bracing.

"It's essentially made up of cold-formed steel sections which are put together to make a box section. It has a simple horizontal ring of steel angles in the corners and four vertical struts to receive the acrow-props, and then there's a .55mm rolled steel stud, which gets rollformed into a 90mm stud section

"At the genesis of our idea for Grid, it was apparent that steel was the ideal solution. When our engineer showed us the rolled extruded steel it ticked the economy and 'buildability' boxes. It's a tenth of the weight of timber for the same strength and when you put it together it's super-strong."

A full-length central beam takes up load at the Grid's middle connection and is also a support for the 'outriggers'. Around 40 people were inside it while on display in Martin Place and Carter noticed some minimal vibration. His engineer advised simple cross-bracing between the acrow-prop struts to fortify Grid for atypical occupancy.

The architects estimate Grid can house up to eight people. Sleeping quarters are provided in the 2.4 by 4.8-metre mezzanine level, which could accommodate a pair of king-size beds or a horizontal series of submarine-style fold-down bunks.

The mezzanine level, typified by its raked ceiling, also provides spatial differentiation. "Even though it's this very basic, pragmatic structure, we wanted to put spirit in our building – to create a nice space; a sense of joy.

"This project was born out of the idea of helping people, en masse. It's not bespoke architecture for the few. It's simple architecture for the many, but that doesn't mean it can't be resolved.

"We wanted the design to have a purity about it; to have a single material on the outside and another on the inside. When you open the skin, it has this lovely warmth. We also wanted the form to be instantly recognisable. The pitched roof form plugged into the idea of the universal imagery of a home – it's like a picture that a kid draws."

The shelter is self-sufficient, incorporating a 160 watt-hour photovoltaic (PV) cell for heating. 'Barn-door' windows and doors cut into each of Grid's four facades allow for cross-ventilation and can be locked flush, securing the building.

Carter and the practice's Linda Matthews spent the night in the Grid while it was installed in Martin Place as part of the Sydney Architecture Festival. Apart from some noisy skateboarders, they had a comfortable stay. "You feel really safe, stowed away up there, sealed off from the outside. Steel's impenetrability adds to the sense of security and shelter," says Matthews. She also points out that "we're quite likely to be the only people to have slept in their own house in Martin Place".

The PV cell, rainwater tanks, a composting toilet system, shower and gas bottles are housed outside the main structure to avoid any failures compromising the interior. "It's particularly important for people in disaster situations to have consistency. They certainly don't need a battery, toilet or tank failing, so we came up with the idea of external outriggers for all ancillaries."

The adaptability of the Grid shelter lends itself to other forms of housing. "As a modular space they can be configured to adapt to different requirements. You could leave walls out and tack them together as a long building. Put them back-to-back, stagger them, cluster them – they're highly versatile."

Carterwilliamson is also developing a residential version of Grid, called Pavilion, which will feature covered outriggers and a more refined interior.

The architects unsuccessfully shopped the Grid concept to the Federal Government before concluding that a prototype needed to be built. "We realised that the more real we made this thing, the more interest we'd get in it. And that's proving the case. It's been seven years from idea to model, to prototype, but we're now getting initial sales."

The cost of Grid is dependent on order volume but Carter was able to throw around some ballpark figures.

"This thing has to be fundamentally economical because we have to satisfy that humanitarian need. If we're dealing with emergency applications we'll be selling not one but thousands of them. With that kind of volume we think we can get the price down to somewhere around $5000 to $10,000 per unit, to flat-pack. Transport and construction costs would be extra."

The architects are already in discussion with national aid organisations AusAID and Austrade, and have longer-term plans with the United Nations Mission. In the meantime they are considering a basic-specification residential version.

"When you say to someone 'we can give you about 35 metres of habitable space for around $40 grand', it's a pretty attractive proposition," Carter rightly concludes. SP

BELOW: Echoing the Ikea model, Grid's pre-drilled prefabricated panels are flat-packed for transporation and later assembled using drills and screws. Seven people can erect it in 3.5 hours

PROJECT Grid Shelter **ARCHITECT** Carterwilliamson Architects **PROJECT TEAM** Shaun Carter, Linda Matthews, Lindsey Chandler **STRUCTURAL & CIVIL ENGINEER** O'Hearn Consultants **BUILDER** Go-Steel Building Products **SHOP DRAWING AND ASSEMBLY CONTRACTOR** Go-Steel Building Products **PRINCIPAL STEEL COMPONENTS** Roofing, wall cladding, capping and flashing: metallic coated steel; Structural steel: acrow prop size 0 (1.07-1.82m), perforated steel decking, 125 x 125 x 5mm columns, 50 x 150 x 5mm bearers, 250 x 50 x 1.6mm joists, 90 x 35mm cold-rolled studs (0.75 BMT); Interior: 7mm structural plywood wall lining, 19mm particle board floor lining **AWARDS** Shortlisted for 2013 Australian Institute of Architects Small Projects Award **BUILDING SIZE** 35m² **TOTAL PROJECT COST** POA

MATERIAL FORCE

This bold building is a welcome departure from the shed-like covered outdoor areas that currently dominate in Australia, and it turns heads in more ways than one. Words **Micky Pinkerton** Photography **John Gollings**

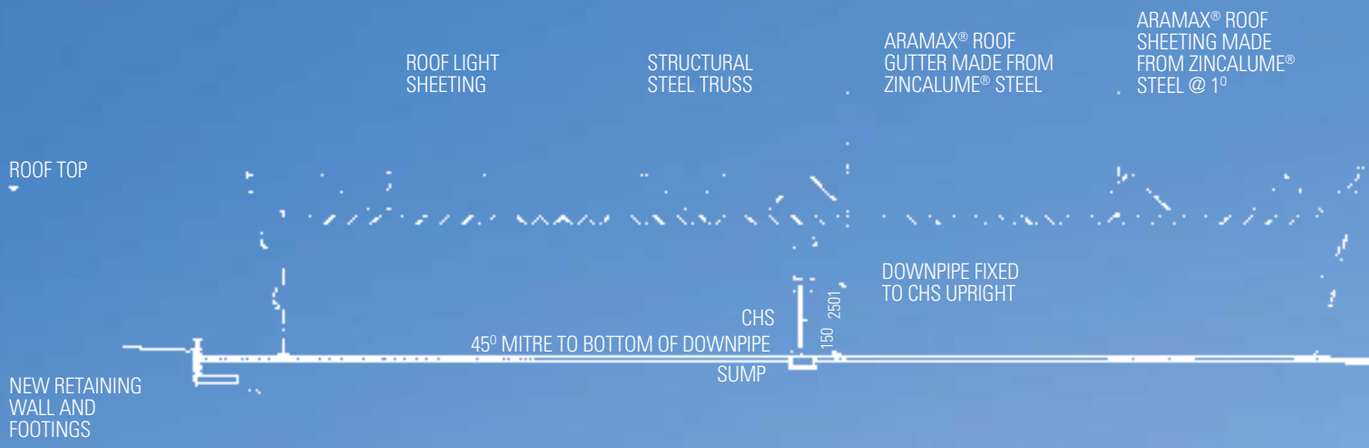
"Raise, train, sustain" is the Army's mantra for ensuring its personnel achieve optimal military capabilities and for 60 years Kapooka has been the reliable backdrop to the 'raise' stage. But it isn't just raw recruits that are transformed here – the architecture has also risen to the challenge by using materials in new ways.

It looks like it's landed from outer space and while the futuristic tubular frame of the new covered outdoor court at Kapooka Military Area is something to marvel at in itself, the real beauty of the building is revealed when standing underneath. Looking up, as any recruit might be expected to do, there's no honking great trusses interfering with the view, just metres and metres of gleaming steel.

The structure features ARAMAX® made from ZINCALUME® steel which was selected for various reasons: it can allow for huge spans without the use of purlins or girts, it is quick to install – leading to reduced construction timeframes – and visually it reflected the no-nonsense image of the armed forces.

"ARAMAX® made from ZINCALUME® steel has a very industrial, very strong look and feel about it, and its profile suited the scale of the building," explains architect Clinton Murray of SKM-S2F. "Serious things are going on here at Kapooka, and we wanted the architecture to reflect that seriousness. We wanted the buildings to be physically robust, to have nothing frivolous or ambiguous about them."

Solemn aesthetics aside, the material's structural properties were paramount to the success of the design.



"The outdoor court really couldn't have been done in anything other than steel because we wanted the big spans and a big cantilever for the shading device of the building," says Murray. "By fixing the ARAMAX® to the underside of the trusses, the continuous spans become quite striking. And there's nowhere for the birds to roost."

SKM-S2F collaborated closely with Barry Young of TTW Engineers on the project. While Young had previously worked with ARAMAX®, it was the first time he had suspended it below the structural frame.

"From a visual point of view, the building is almost upside down and it makes it quite a unique looking structure," says Young. "The methodology we used employed cleats bolted through to the steel trusses above and they were then bolted through to hang the ARAMAX®. This produced the very clean lines and look that the architects were after."

Murray had never before specified ARAMAX® made from ZINCALUME® steel and found the process absorbing.

"The ARAMAX® sheet buckles and twists by nature when it is being installed but then it all clips into place via brackets which fix on the top of the sheet. You get a bit of a shock when you see it going on because it is all bendy and bowing – it almost looks like you're installing bananas – and then all of a sudden it locks into place."

It's a process like that experienced by recruits at Kapooka, where they undergo a similar transition from malleability to rigidity. This building will be the reliable backdrop to that transformation for years to come. **SP**

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PROJECT Kapooka Covered Outdoor Court **CLIENT** Department of Defence **ARCHITECT** SKM-S2F **PROJECT TEAM** Clinton Murray **STRUCTURAL ENGINEER** TTW Engineers
PRINCIPAL COMPONENTS Roofing: ARAMAX® made from ZINCALUME® steel; ARAMAX® guttering. CHS steel tube super structure

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