

# designmag.

the elements of style

Vol. 01



## Reshaping London

Redundant infrastructure born again in the Olympic city

Housing style from Beach Road to Elizabeth Bay

New research on energy efficient design

Art's bad boy lends his name to boutique hotel

Brick "galleries" transforming inner city architecture



**this page.** State Theatre Centre of Western Australia. Design by Kerry Hill Architects. Photography: Robert Frith, Acorn Photo.

**cover.** London's Tate Modern Extension is a spectacular example of the repurposing of redundant infrastructure. Illustration: © Herzog & de Meuron and Hayes Davidson 2009.

**back cover.** Bisle Place house. Design by James Russell Architect. Photography: Eric Victor.

# Inspired by design

Thomas Edison famously said that genius is one percent inspiration and 99 percent perspiration. That's all very well for a genius, but most of us need to go looking for that elusive flash of insight, especially when contemplating a major project such as designing a building.

In this debut issue of **designmag**™ you will find inspirational architectural projects from around Australia, from cutting-edge housing to a magnificent cathedral, an art-themed boutique hotel, a management training centre and more.

We also take a look at some remarkable London buildings, examine the amazing history of the world's best loved building material, and profile a leading young Australian architecture firm.

Green design principles are playing an ever-increasing role in building design and material selection. In this issue there's a special report on recent Australian research into energy-efficient building design and construction.

Complementing **designmag** is Design Place™, an innovative website ([www.designplace.com.au](http://www.designplace.com.au)) featuring detailed photography of selected residential, commercial and landscaping projects, and a summary of the vision behind their design.

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We welcome your comments on our first issue and encourage submissions or suggestions for future projects and feature articles.

Please contact us at:  
[designmag@brickworks.com.au](mailto:designmag@brickworks.com.au).

The 'Illusions Wall' makes a dramatic statement at Austral Bricks' Sydney CBD Design Studio.

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Project management by Woodridge Media Pty Ltd. Artwork by Partners in Design Pty Ltd. Contributors this issue: Tracey Baker, Jon King, Gerry McLoughlin, James Russell, Mike Scully, Scott Willey.



# Child's Play



## Quick Facts

### Rolling Cubes

**Location:** 14 Frenchman Drive, Port Elliot SA

**Owners:** Shane and Caroline Hendriks

**Designer/builder/**

**Terraçade installer:**  
ABC Advanced Building  
Constructions

## Featured Products

Terraçade® terracotta  
facade system

Take a generous allotment of prime real estate in a beautiful coastal location south of Adelaide, a lifetime of building industry experience, a vision beyond the boundaries, and hey presto: Rolling Cubes.

**Five years ago, Shane Hendriks, a South Australian builder and building designer, began planning and designing his most aspirational project: his own home.**

Dubbed Rolling Cubes, the three-bedroom two-level home is made of five equal, yet different shapes: two main vertical cubes and two outer wing cubes that connect via a central cube.

This unconventional home is located in the picturesque town of Port Elliot on South Australia's magnificent Fleurieu Peninsula. Any passerby would be forgiven for doing a double-take. The commanding structure stretches 40 metres wide and its highest point rises eight metres high into the sky.

Where did the innovative design idea come from? "I was playing with my kids and watching them play with boxes, I developed the concept from there," Shane says simply.

Rolling Cubes embodies building design and construction principles opposite to conventional standards. "I did this as a challenge to myself. I wanted to push the limits and went out of my way to prove it could be done," he explains. "I wanted to be quite different and do the opposite to what is normal."

Like many new homes, Rolling Cubes began with a concrete slab, but that's where it ends. The Australian-developed Terraçade terracotta facade tile system overlays the complex steel frame and internal walls of aerated concrete.

Terraçade is a lightweight walling system that acts as a rain screen and ventilated facade system. The tiles, each 300mm by 600mm, are captured on purpose-designed rails that can be fixed directly to most conventional building structures. The system is fully tested to all relevant Australian Standards and is suitable for use in cyclone areas and coastal locations.



**previous page.** As dawn rises, Rolling Cubes seems to extrude out of the earth in the sleepy seaside village of Port Elliot.

**this page.** The Terraçade lightweight walling system allows part of the three-bedroom home to literally float above the site. For Shane and Caroline Hendriks this is their family home as well as an outstanding example of his builder's art. A blend of five terracotta colours creates an earthy connection between the building and its site.

With an eye for detail and quality, Shane saw the natural, earthy elements and stylish colours of Terraçade as a perfect visual match to his design concept. A blend of black, eggplant, khaki, mocha and light grey tile colours were chosen to create an earthy connection between the building and the environment. (Some colours may not be available in the current Terraçade colour palette.)

However, the real beauty behind Rolling Cubes lies just as much in the smart ecological design as in its creator's capacity to think outside the box.

The ventilated cavity behind the Terraçade tiles complements the building's energy management system by venting continuous ground-up airflows and thereby helping naturally moderate the internal temperature.

In the overall design process, long-term practicality also had an influence on the end result. "Terraçade tiles are a modern product, they need no maintenance or painting," said Shane. The system is guaranteed for 15 years and there is a lifetime warranty on the colourfastness and durability of the tiles. Most system components are recyclable and the tiles are fully reusable.

Forty-six stairs unite two lower-level work areas and open up to a modest 270 square metres, including upstairs living space. "It's a bit of labyrinth inside," Shane admits. A central stairwell also leads to an upper level outdoor deck overlooking the native garden.

Rolling Cubes is fast becoming a landmark to locals and tourists alike. What really strikes one's curiosity about this project is the natural synergy between art and architecture. It is a complex project and people perceive it as such.

But Rolling Cubes is more than just an unusual and eye-catching home. As Shane says, it is an art project. He attributes his creative talent to his father, Will, also a builder, who has turned his hand to art and sculpting in his retirement. It seems Shane is the beneficiary of his father's artistic and visionary flair.

Terraçade is exclusively distributed within Australia by Alucobond. More information including comprehensive technical manuals and more design ideas at [www.terraçade.com.au](http://www.terraçade.com.au).

"I did this as a challenge to myself. I wanted to push the limits and went out of my way to prove it could be done,"



Photography: Alice Bell Photographics

# ART HOTEL GOES FROM GRUNGE TO GLAMOUR

Adam Cullen, the “bad boy” of Australian art, achieved respectability when he won the 2000 Archibald Prize. In a more recent sign of the wider acceptance of his controversial and sometimes confronting “grunge art”, his name now sits atop The Cullen Hotel, the first in a series of art-themed, boutique hotels.



## Quick Facts

### The Cullen Hotel

**Location:**

Commercial Road  
Prahran VIC

**Developer/builder:** Asian  
Pacific Building Corporation**Operator:**

Art Series Hotel Group

**Architect:**

Jackson Clements Burrows  
& Capitol Commercial  
Architecture

**Structural Engineer:**

Rincovitch & Partners

**Bricklayer:**

EGL Bricklaying

## Featured Product

Austral Bricks® Elements®  
Zinc semi-glazed clay bricks



"We liked the idea of the bricks being able to connect right to the ground. We wanted to feel the weight of the building, for it to be well grounded and have a sense of mass."

Photography: John Collings, Michael Laurie

**The Cullen Hotel occupies a high-profile site, formerly holding a nondescript tyre depot, in Commercial Road, Prahran opposite the famous Prahran Market and in the heart of one of Melbourne's premier shopping and entertainment precincts.**

Such a prominent project and location demanded a premium façade material. Austral Bricks Elements Zinc semi-glazed bricks "were pretty much always our first choice," says project architect Rob Kennon. Their metallic finish "had a bit more intrigue. That shimmer and sparkle is inherent in their materiality."

The hotel has 119 apartments over its seven levels, including six rooftop penthouse suites. There are retail tenancies at ground level, a rooftop function space and one level of below-ground parking. Over 400 works by Adam Cullen are placed throughout the building including two life-size fibreglass cows in the foyer!

Jackson Clements Burrows design team – Rob Kennon, Tim Jackson, project director and Michael Stelluto, associate architect overseeing documentation – were responsible for the design concept and development through to town planning approval. Their work was then passed over to Capitol Commercial Architecture, Asian Pacific Building Corporation's in-house design department headed by Jeff Porter, which took the project through the design development and construction phases.

Kennon describes the façade design as a "very strong push and pull concept. We were playing with depth" The most prominent expressions of this are balconies, expressed on the western façade and recessed along the Commercial Road frontage. "A conventional two-dimensional façade wouldn't have the ability to cast shadows on itself," he adds.

Although the building is not tall, the brickwork gives it a more monolithic appearance. "We liked the idea of the bricks being able to connect right to the ground. We wanted to feel the weight of the building, for it to be well grounded and have a sense of mass."

Brick was the façade material of choice from the early concept meetings. "We liked the craftsmanship of brick and the fact that it's literally laid one by one, so there's more of a finer grain to it," Kennon reflects. "There is precedent for it standing the test of time so it gives the building longevity."

Detailed set-out of the brick courses was essential in such a large construction to ensure corners ended on whole bricks. Computer-aided design allowed the placement of every brick to be readily detailed. The brickwork sits on shelf angles at each level.

Mortar joint colour and finish is always an essential design consideration. A dark charcoal colour was selected after site testing. The joints have a shallow, ironed (half-round) finish.

"It was a bold move for Jackson Clements Burrows to go with Elements Zinc bricks," Capitol Commercial Architecture's Jeff Porter considers, "but I think it's been a very successful choice."

The Cullen has received a number of accolades including placement in the prestigious Condé Nast Traveller Hot List.

"Choosing the painter Adam Cullen, Australian art's angst-ridden enfant terrible, as the inspiration for The Cullen has proved a masterstroke," said the Condé Nast judges who described the building as "cleverly designed" with "visual provocation (awaiting) at every turn."

**previous page.** The first in a series of art-themed, boutique hotels, The Cullen is in busy Commercial Road, near the popular Chapel Street shopping and entertainment precinct.

**from left.** The "push-pull" facade design adds dimension whereas the brickwork imparts a more monolithic appearance. Internally, the hotel features works by controversial artist Adam Cullen in the suites and public areas. The semi-glazed bricks change colour as they reflect the ever-changing light.



# Survival of the Fittest

Bricks, one of our oldest and most basic building blocks, have evolved to meet the needs of contemporary designers in today's climate-challenged world. By Gerry McLoughlin, architect and urban designer.

**The craft of mixing clay and water to make a paste and baking it in the sun to form the most basic of building block has been with us for over 75 centuries.**

The earliest known bricks were made before 7500BC in the Tigris Valley, now Syria. The first sun-dried bricks were made in Mesopotamia (now Iraq) in about 4000BC. The earliest fired bricks were discovered in the Western Zhou ruins in China, and are estimated to date from 1000BC.

The Romans fired bricks using mobile kilns, thus introducing the technology throughout their empire. They were often stamped with the mark of the legion supervising their production. The use of bricks in southern and western Germany, for example, can be traced back to traditions described by the Roman architect Vitruvius.

To consider the earliest known brick is over three times older than our modern civilization certainly tells a story of a very basic need for secure shelter and protection. Drawing from materials immediately available, earth, sun and water, to make the most primitive building block, the desire to create shelter is as old as mankind. In fact in primitive languages the first word is often an expression of 'I' and the second is 'shelter'.

The cloud-like facade of McBride Charles Ryan's award-winning Penleigh and Essendon Grammar assists in passively cooling the building. (Photo: John Gollings)





Robin Boyd's Ivanhoe home built in 1970 for designer Grant Featherston capitalises on honest, unadorned materials such as timber, brick and glass. (Photograph courtesy Robin Boyd Foundation.)

**below.** Malbork Castle, built by a Teutonic order of knights, was the biggest brick castle in the world when completed in 1406.



## Wright, Boyd and beyond

The twentieth century saw the rise of eight-storey brick office buildings. Cities such as Chicago and Melbourne competed fiercely in the late 1800s for premier status as the most progressive cities of the world, not to mention having the tallest buildings of the day.

With the advent of modernism came new construction technologies such as steel and concrete and curtain wall construction technologies but brick never lost its viability as a desirable building material.

Chicago's greatest architectural son, Frank Lloyd Wright, took the American people, and for that matter the rest of the new world, on a journey to express in our dwellings what it is to be a free and democratic society. Lofty ideals were explored in floor plans, horizontal lines, and honest materials such as timber, brick and glass, all within the reach of the ordinary family. His Usonian House was the embodiment of democratic values. It not only reignited Wright's flagging, controversial career, but also provided a model for affordable housing for the vast numbers of returning servicemen and women ready to start families after the Second World War.

Wright built 140 Usonian Houses from 1936 until his death in 1959. This was part of a vision of housing close to the earth in a natural setting – typically on a one acre lot that provided the most healthful environment for ordinary families to live in at an affordable price. All superfluous elements were eliminated from the design or were built in, such as furniture, book cases and lighting. The strong use of natural honest materials of oiled timber paneling, exposed brick structure and glass draw direct reference from the natural world. Interiors are dominated by the central hearth – tall masonry fireplaces of unadorned brick or stone that provide an anchor for open living spaces.

Australia's most famous architect of the 1950s and '60s, Robin Boyd, was renowned not just as an architect but an author, commentator, critic and public educator and leader in Melbourne's Modern Architecture movement. More a humanist than a modernist, Boyd's siting of often quite modest houses created wonderful architectural gems in the Australian landscape context. These houses are well and truly anchored to their sites with natural brick flooring and slab heating (experimental in its time) which gives a sense of being 'earthed' immediately on crossing the threshold. His houses have an emphasis on exposed materials of timber, brick and glass. Climate control was achieved by the clever use of 'parasol' roofs and ventilation paths across the houses or central oasis gardens that create a sense of water and green at the heart of the house.

Important views were captured to achieve visual links to the site's natural context. Exposed timber, brick, stone and glass are the core materials of Boyd's buildings. These are honest unadorned materials, building blocks as old as civilisation itself.

These houses speak to us. Clearly, Robin Boyd was fiercely democratic in his views, believing it was everyone's natural right to "affordable beautiful housing. Housing is more than just shelter it's the place of sanctuary and reflects the values of a civilisation".

Karl Fender, outgoing AIA president, who worked for Boyd until his untimely death at 52 in 1971, spoke of Boyd's passionate belief that design could enrich people's lives and of his dedication to communicating this to the general community.

## Ideas that delight

Between the wars, brickwork was the source of highly decorative building ornamentation and articulation on important buildings such as hotels, schools, commercial buildings and large industrial buildings such as Ford Motor Company and the Commonwealth Wool Stores. This art has all but been lost in the standardisation of the mass housing market that occurred in the 1960s and '70s when construction was streamlined to minimise delays and costs.

The advent of mass housing spreading out into new suburbs of the late 1940s to the 1970s was the 'elephant stamp' version of the design principles established in the works of great architectural experiments such as the Usonian houses and Boyd's Small Homes Advisory Service. Ordinary materials were coupled with good design to express great ideas that delight as well as providing the basic need for shelter.

Australia's love affair with the brick veneer was the story of the suburbs. It was the ideal of family life, living in garden surrounds that provide the optimum shelter and a setting to raise children. It was also the notion that it was possible for every working family to own a quarter acre lot. These values were supported by successive governments which fostered a social democratic public policy platform that created a stable economy and delivered affordable housing for the masses.

Melbourne and Sydney's middle-ring suburbs were created during this period. Massive construction took place to meet the pent-up demand for decent, affordable housing.



(from top) The new Penleigh and Essendon Grammar building sits comfortably in its Federation suburban streetscape. McBride Charles Ryan's principals Rob McBride and Debbie Lyn Ryan. The colours and texture of the award-winning Fitzroy High School reflect the local community's aspirations. (Photos: John Gollings.)



## Facing the climate challenge

We are again in a time of housing crisis and contemporary Australian architects are reinterpreting many of these ideas in interesting ways.

Today's designers however are facing the fresh challenge of climate change and the important role that housing design and material selection can make.

"The environmental potential of bricks can be maximised if their thermal mass is designed for," comments sustainability architect Scott Willey. "With brick's ability to store warmth and 'coolth', building bricks into the interior can help make us more comfortable at home by evening out day/night swings in temperature. This means warmer winter nights and cooler summer days. To boost this effect, allow low-angle winter sun into the interior on sunny days. In summer, the sun should be excluded. Opening windows overnight when the air is coolest (usually the hours after midnight), allows for the stored heat to be purged."

Of all the material choices, wall selection accounts for 60 to 70 percent of the thermal mass of the building, with the floor largely accounting for the balance. Generally, the more thermal mass the better. A well-designed double brick or masonry home on a concrete slab offers the highest potential comfort benefits and energy savings.

The architectural community has long understood the changing nature of the city to a denser, more design-conscious urban centre. To meet this evolving need the brick industry is changing not just its products but the way it does business.

Melbourne's population growth and the growing awareness that we need to live within the existing infrastructure footprint has led to densification of the inner city, a pattern that is being repeated in Australia's capital cities. Retro fitting and reworking infill sites is big business. Inner city local government authorities have recognised that housing demand can be met by rethinking many of the underutilised/undeveloped sites or redundant light industrial sites.

To meet the challenge of growing from a city of three million people Melbourne, for example, is undergoing a complete renaissance to one of potentially eight million by 2080, more akin to major European cities such as Barcelona or Berlin.

## Four architectural responses

A series of clever projects have been designed by leading architects who have demonstrated foresight in not only meeting the challenge of a changing city, the demands of designing for climate change and affordability but also making buildings of real civic meaning.

McBride Charles Ryan's recent AIA award winning Penleigh and Essendon Grammar School project is a striking building in itself. However, what is not commonly appreciated from the glamorous photos is that this project has very clever passive design features that are intimately linked to a major architectural feature, a black glazed brick wall.

The extruded silhouette is an amorphous cloud-like form that allows the internal spaces to be passively cooled by drawing in air from the south façade and expelling hot air through a thermal chimney, thereby creating a source of light and a means of naturally ventilating the classroom spaces.

Principal design architect Rob McBride and interior architect Debbie Lyn Ryan chose the materials for this project very carefully because of the civic significance of projects of this nature.

"I love brick because it lasts. So much that is built in our world is short term. Brick demonstrates a belief in the future. Public buildings were once the centre of a community and the buildings showed it. A school, a church, a bank and a pub would make a town. They were stable, solid and lavish compared to other buildings. What do we value as a society today?" Ryan contends. "Penleigh and Essendon Grammar School is predominantly BER funded. I think we have given the school something that has value: It has meaning, it is knitted into its neighbourhood and I hope it will last. We intended to show that this building is important and in turn that education is important."

"Brick allowed us expression – its size allowed us to shape easily with a standard component. The component comes in many finishes; the black glazed brick was perfect for 'the upsized silhouette' of the Federation house – not quite residential, not quite institutional, a new hybrid. Pure silhouette, no articulation, no windows – just black shiny bricks. The west facade has the stripes of the Federation grandstand – the brick seats with a view over the playing fields for generations to come."

MCR's Fitzroy High School project stands proud with a multi glazed brick curvilinear forms which is a fitting reflection of the school's pioneering new teaching methods.



The corbelled fence of Corbett Lyon's remarkable Housemuseum creates a strong street presence. The private home holds the Lyon art collection and is open to limited public viewing by appointment. (Photos courtesy Lyon.) Andrew Maynard's Ilma Grove house exploits passive design principles. (Photo courtesy Andrew Maynard Architects.) Red stripes on the roof of Penleigh and Essendon Grammar's western evoke a Federation grandstand. (Photo: John Gollings.)

"Fitzroy High School employed brick because it allowed a fluid form which could be highly coloured and textured," says Ryan, reflecting on her selection of the variegated brick colours for this project. "Its ambition was to be 'urban marker' of a community which has artistic and sustainable ambitions. The school wanted to show to the wider world that they were embracing a new way of teaching and that this building was a community building for ongoing learning."

The award-winning Lyons Architects' Mornington Centre features bricks specifically designed to look like the texture of timber. Their more recent Housemuseum in Cotham Road, Kew features a beautiful brick fence, again a quintessential play on the suburban brick fence.

"The design work of our practice is research led and one of our interests is looking at how conventional materials (like bricks) can be used in new and interesting ways," says Corbett Lyon. "Bricks have been around since Roman times and here in our Australian context they have a special place in our suburban landscape. At the Housemuseum, the front fence is made from suburban bricks – so it looks much the same as all of the other houses in the street – but acknowledges the Housemuseum's role as a public/civic building, the names of the two street frontages incorporated in the brickwork in three-metre high letters. The corbelled brickwork also gives the fence a textual quality and a strong presence to the street."

More and more interesting projects are emerging around the inner and middle suburbs of clever design that also perform well environmentally.

The recently completed Ilma Grove house is Andrew Maynard Architect's greenest house so far. Its planning and orientation is based solidly around passive solar efficiency and takes advantage of the north facing backyard. This extension was a development of an idea around an exploration of mass where segments were carved out in order to maximize sun penetration. This generated a geometrical structure where the internal flesh of the box is revealed with rich timber surfaces, contrasting with the raw recycled brickwork.

The choice of materials was a vital step in order to create a sustainable structure. It was decided to re-use/re-assemble the existing bricks from the demolished areas of the old part of the house to form the new addition, blurring the line between what is new and what is old.

Using recycled materials is a sustainable choice, however there is still a carbon debt accrued by the transport and reworking of materials. The Ilma Grove house avoids this by reusing the bricks of the demolished lean-to on site. This avoids waste, landfill and transportation of materials, and ties the material language of the new structure back into the original house.

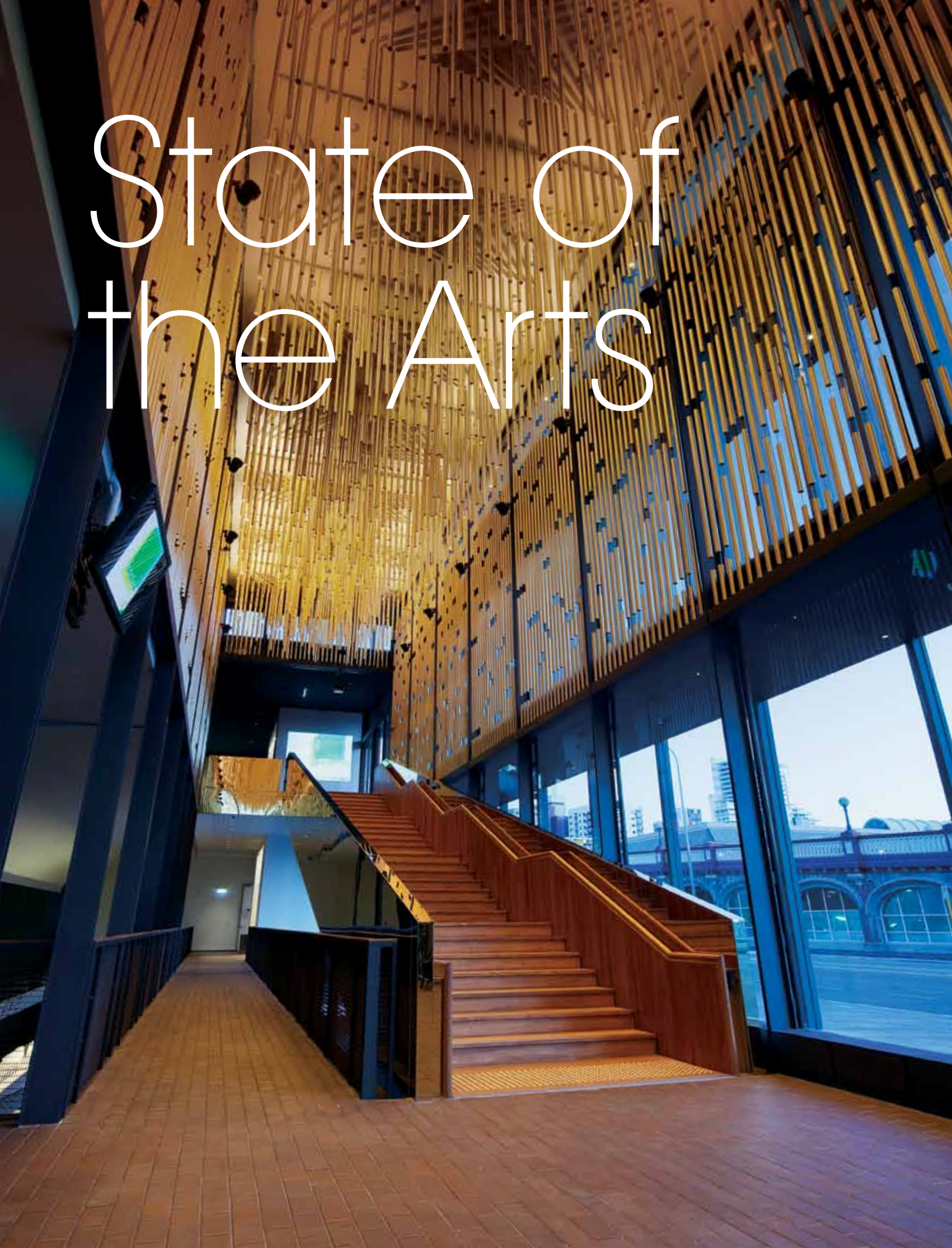
Face brick masonry is also a durable and a low maintenance material which can potentially be recycled again. Reinforcing the thermal performance of the recycled brick is high performance insulation that has been installed throughout the home.

Bricks are the ultimate recyclable material.

Think Brick Australia's Designing for Climate website ([www.designingforclimate.com.au](http://www.designingforclimate.com.au)) can help you understand your site and the opportunities for maximising passive design features to achieve optimum comfort and reduce energy consumption.



# State of the Arts



The robust exterior of the State Theatre Centre of Western Australia opens to reveal delicately-crafted interior spaces that unfold, surprise and delight.

**The late, Perth-born actor Heath Ledger "must have been a bird on the shoulder of the architect" of the new State Theatre Centre of Western Australia, according to his father, Kim Ledger, speaking at the opening of the \$100 million facility.**

The 575-seat Heath Ledger Theatre is at the heart of the complex, along with a more flexible space, the 200-seat Studio Underground, as well as generous rehearsal and backstage facilities. His sister, Kate Ledger, added that "It's so reflective of the way he built and renovated his houses, it's quite eerie."

Perth-based Kerry Hill Architects was the unanimous winner of a design competition that attracted 40 submissions from around the world.

The Centre's architecture arises from a dialogue of opposing forces.

- A sense of darkness and light.
- An expression of mass and transparency
- A language that is both robust and delicate.

The building imparts a sense of spatial drama to the experience of attending the theatre. The volumes are clearly articulated, with the two centrally-located theatres stacked vertically, freeing up space for a large courtyard which is both an urban plaza and outdoor event space.

The courtyards and the lower ground and ground floor public areas are paved with Bowral Bricks London Blue clay pavers, including the areas under the spectacular curtain-like Bronze Box. The clay paving creates a solid ground plane that effectively contrasts with the black metal, bronze and Tasmanian Blackwood feature timber that is the Centre's internal signature.

The foyers are located on the site's perimeter: these are low transparent volumes that reflect the scale of the surrounding streets and celebrate the activity within. By day, these external volumes rest calmly, with the dark and robust materials forming a protective shell. The layered reflection of glass facades suggests, but does not reveal, what is within.

**previous page.** The dramatic gilded curtain of the Bronze Box underlaid by a clay-paved foyer creates a dramatic counterpoint to the more austere exterior of the State Theatre Centre of Western Australia.

**this page.** Clay pavers form a ground plane on the lower ground and ground floors, spilling out into the Courtyard. Bowral Bricks Bowral Blue bricks feature in the walkways, bars and some internal open spaces as well as the lightwell.

However, as night descends the volumes begin to glitter and glow; the fly tower takes on a sublime light; the foyers, multi-levelled and veiled in delicate gold screens, reveal themselves to the street; a floor of glowing glass reaches out below a suspended canopy.

A generous staircase leads to the Heath Ledger Theatre, a curved timber drum that peels away from a panelled concrete shell. Within is a world of warm timber and gold hues. Balcony seating wraps the curved walls, heightening the sense of intimacy and interaction.

Studio Underground is located below the Heath Ledger Theatre, isolated acoustically and structurally. Descending from the entry level, one enters a subterranean world of striated plywood and dark bricks – Bowral Bricks Bowral Blue. This softly-glazed brick shimmers and refracts light. "Brick is an appropriate material for Perth," comments project architect, Simon Cundy. The same bricks also line the substantial light-well and feature in walkways, bars and some internal open spaces.

Studio Underground's interior celebrates the robust, industrial language of grids and trusses that are a requirement of a flexible performance space. A large opening connects it to the primary rehearsal room, extending performance possibilities.

A series of passive systems reduces the building's energy consumption. The space between the two theatres is utilised as a thermal labyrinth, preconditioning outdoor air before it is processed by the air conditioning system. A sophisticated system of vents allows the foyers to be naturally ventilated. Daylight penetrates deep into the building through the use of skylights and transparent facades, reducing dependence on artificial lighting.

"I think we're a little bit humbled by all this and very grateful to all the people of Western Australia," said Heath Ledger's mother, Sally Bell. "It's just an amazing tribute."

The State Theatre Centre of Western Australia won the prestigious Emil Sodersten Award for Interior Architecture at the 2011 National Architecture Awards. It also won the 2011 President's Design Award, Singapore's most prestigious design accolade, and a 2011 Australian Engineering Excellence Award.



## Quick Facts

### State Theatre Centre of Western Australia

**Owner:**

Department of Culture and the Arts, WA

**Location:**

174 William St, Perth

**Architect:**

Kerry Hill Architects

**Structural engineer:**

Airey Taylor Consultants

**Builder:**

John Holland Group

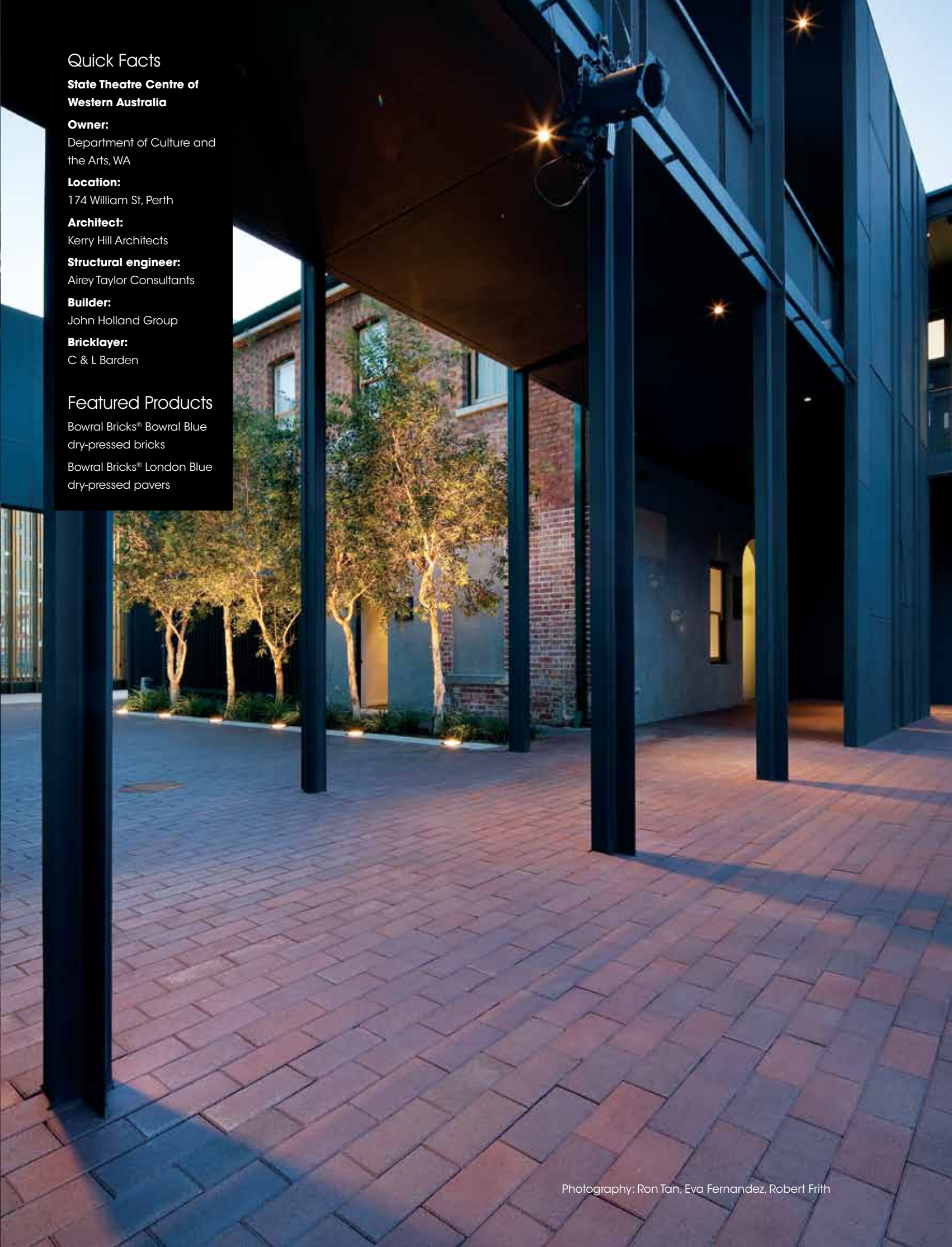
**Bricklayer:**

C & L Barden

## Featured Products

Bowral Bricks® Bowral Blue dry-pressed bricks

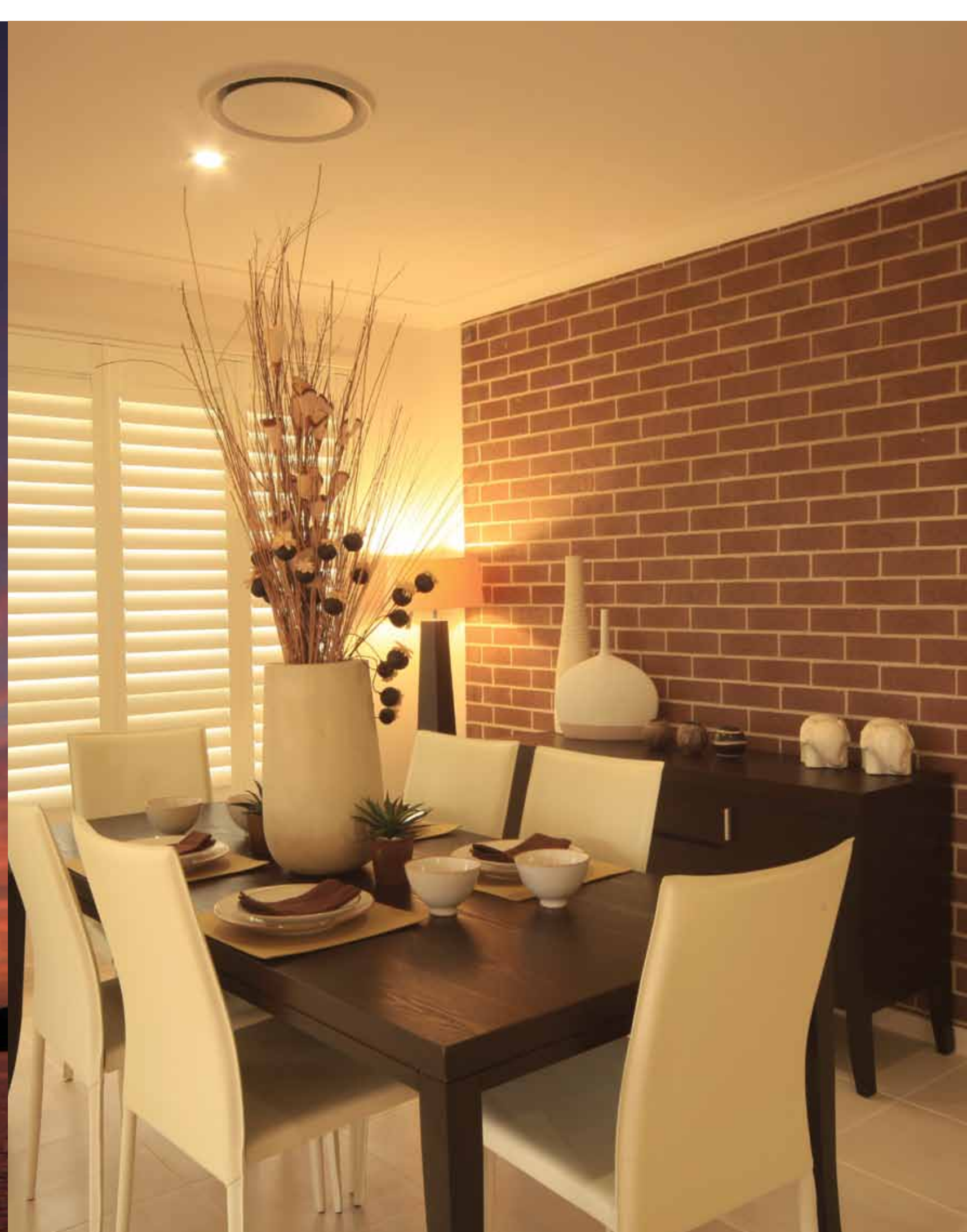
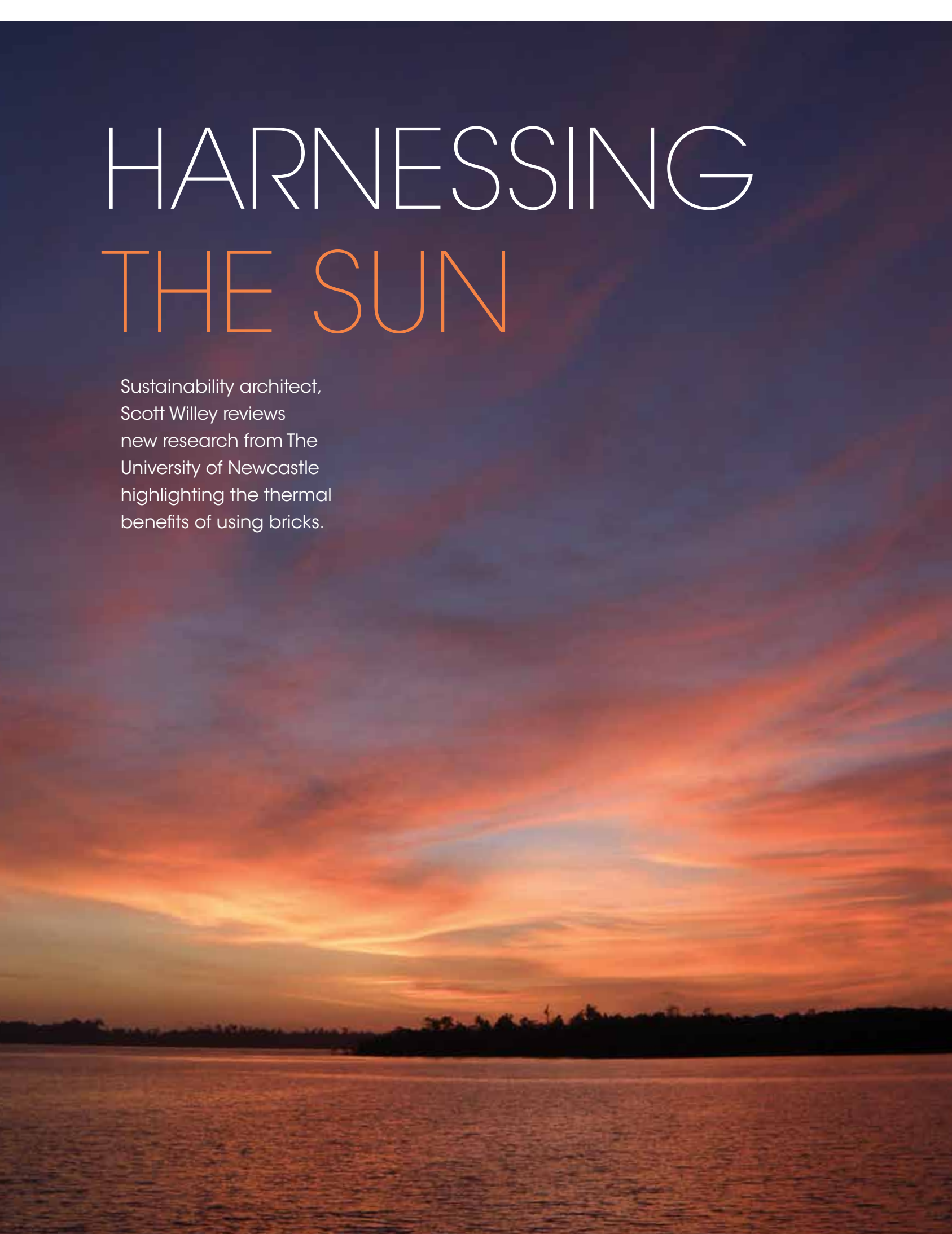
Bowral Bricks® London Blue dry-pressed pavers



Photography: Ron Tan, Eva Fernandez, Robert Frith

# HARNESSING THE SUN

Sustainability architect,  
Scott Willey reviews  
new research from The  
University of Newcastle  
highlighting the thermal  
benefits of using bricks.



'A Study of the Thermal Performance of Australian Housing', the first stage report of an eight year research program, was published in June 2011 by Think Brick Australia's research partners at The University of Newcastle. The research explores the thermal advantages of clay brick in domestic construction and shows that brick construction can improve thermal comfort and therefore reduce energy usage. To harness this potential, bricks need to be acknowledged not just for their insulative properties but more importantly for their thermal capacitance (thermal mass).

## Bricks, energy and the Australian home

The energy used in the daily operation of an Australian home when averaged over its life is estimated to be over 90 percent of its combined embodied and operational energy. With the largest proportion of this energy being used for heating and cooling (38 percent), there is an emphasis on targeting thermal comfort in homes as a way to reduce energy use. An energy-efficient home provides a high degree of thermal comfort without over-reliance on artificial heating or cooling, while offering adequate natural light and ventilation.

The ability of the earth to capture and hold heat has been harnessed by mankind since the dawn of civilisation. The process of firing clay provides water resistance, stability and strength, although the energy required to achieve this is significant. By weight, brick manufacture requires a relatively low amount of energy, though the weight of brickwork in domestic wall construction is comparatively high. However, the energy used in their manufacture – embodied energy – is small when considered over the life-cycle of a building.

With almost 90 percent of new homes in Australia using brick construction, it is important that designers and other decision makers are aware of how to take full advantage of the energy-saving potential that clay brick construction offers.

Where interiors are exposed to enough thermal mass, the warmth of the day can be captured and held to increase comfort on cool evenings, and the cool of the night can be captured to improve comfort on hot days. The higher the variation between day and night temperatures – the diurnal variance – the greater the potential for brickwork to moderate interior house temperatures.

The Austral Bricks-Ausbuild 8 Star Display House in Victoria Point, Queensland demonstrates that comfort, sustainability, affordability and contemporary style can be affordable and attractive. The thermal mass inherent in clay bricks is an essential component of a passive design.

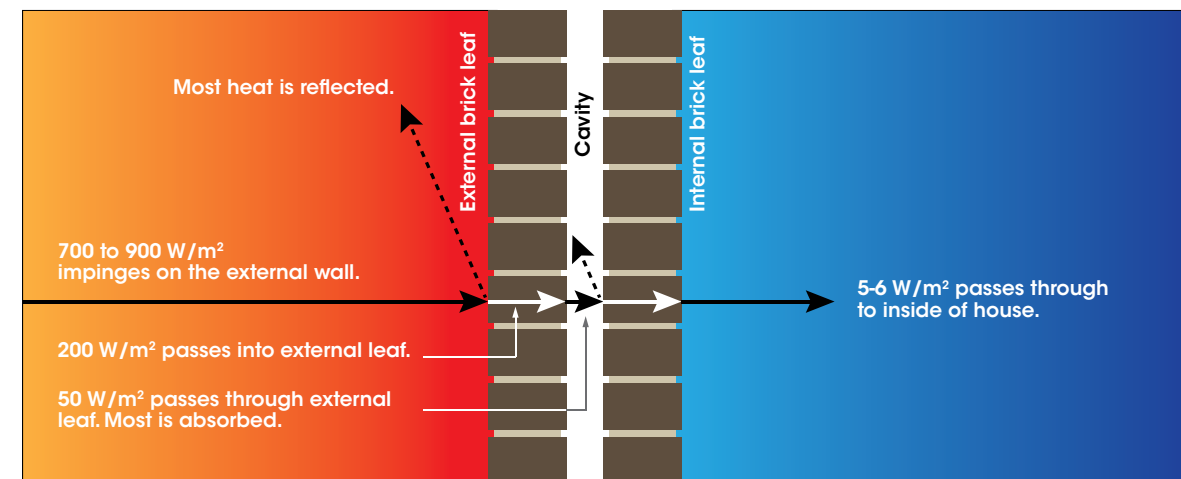


## New research highlights the benefits of using bricks

It has long been known that the thermal mass of brick is high due to density. This research quantifies the ability bricks have to absorb, slow the transfer of, and re-radiate heat in a way that offers more occupant comfort than just considering their measured resistance to heat transfer (R-value).

Working with Think Brick Australia since 2002 to quantify thermal performance, The University of Newcastle's Priority Research Centre for Energy built and monitored four identically-sized (six metres square) test buildings that mimicked standard domestic construction. Each building had a concrete slab-on-ground floor, although wall constructions varied:

- Cavity brickwork
- Brick veneer
- Reverse brick veneer
- Lightweight (timber-framed) construction



**Figure 1:** Heat flux through a west-facing, cavity-brick wall in summer. This shows that only 5-6 W/m<sup>2</sup> of heat energy on average passes into the internal space.

(Adapted from Energy Efficiency and the Environment: The Case for Clay Brick, published by Think Brick Australia.)

By logging the test buildings' responses to the Newcastle climate and smaller laboratory-based test cells in identical conditions, the research showed thermal advantages offered by brick construction:

- The ability of brick construction to store heat, and delay heat transfer (thermal lag) increases thermal value beyond merely their measured insulative properties (R-value).
- There was no correlation between R-values and energy consumption; walls with thermal mass performed better than lightweight walls with an R-value three times greater.
- Brick veneer exceeded the thermal performance of lightweight construction with the lightweight building being the worst performer in all seasons.
- R-values alone cannot be used as a sole predictor of thermal performance with no correlation between R-value and energy use.

Note the test cells results are shown for a Newcastle climate. Check the full report, which is listed at the end of this article, for details.

**Cavity brickwork** The report notes that insulated cavity brickwork construction "provided the most consistent and predictable behaviour" of any of the wall types. When air-conditioned, this construction required less energy to keep it within the comfort range. This is linked to the ability of the internal brickwork skin to assist in regulating temperature.

**Brick veneer** Often thought of as merely cosmetic, brick veneer offered a heat lag of

four hours and when insulated has been shown in the research to provide an improvement in thermal comfort over that of lightweight construction. Brick veneer was shown to have high summer temperatures, though adding cavity insulation helps reduce these. Adding internal thermal mass can also improve this performance.

**Reverse brick veneer** Often thought of as the 'holy-grail' in building, the brick veneer is placed on the inside where it can be best utilised to regulate thermal comfort. Testing showed the performance of insulated reverse brick veneer was marginally inferior to insulated cavity brickwork due to the lack of thermal mass in the external skin. It was more vulnerable when exposed to high solar gain than insulated cavity brick which required less energy consumption under controlled conditions.

**Lightweight (timber-framed) construction** While insulation in lightweight walls reduces the amount of heat flux through external walls, the lack of significant thermal lag means peak internal temperatures will more closely follow external conditions. Of the four wall constructions tested, the lightweight assembly had the highest daytime peaks and the widest divergence in daily internal temperatures. Even though the lightweight wall has a higher R-value than the insulated cavity brick, the lack of thermal mass means decreased comfort levels for occupants. And when air-conditioned, the lightweight test building "consistently had the highest energy consumption."

The inability of lightweight construction to store heat means it is unable to store overnight 'coolth' to assist in moderating summer temperatures.

## Maximising comfort with brick

Designers may not control the energy used by appliances in the home directly, although through good design they can offer a significant improvement in thermal comfort for the life of their buildings.

**Increasing internal thermal mass** The thermal capacitance of bricks can be used with greatest effect in climate zones that have large diurnal temperature shifts. The Newcastle research highlights the value of insulated cavity brick construction to produce the most stable thermal comfort of those tested. The housing market has traditionally favoured brick for its appearance and low maintenance, though this is often achieved with brick veneer at lower cost.

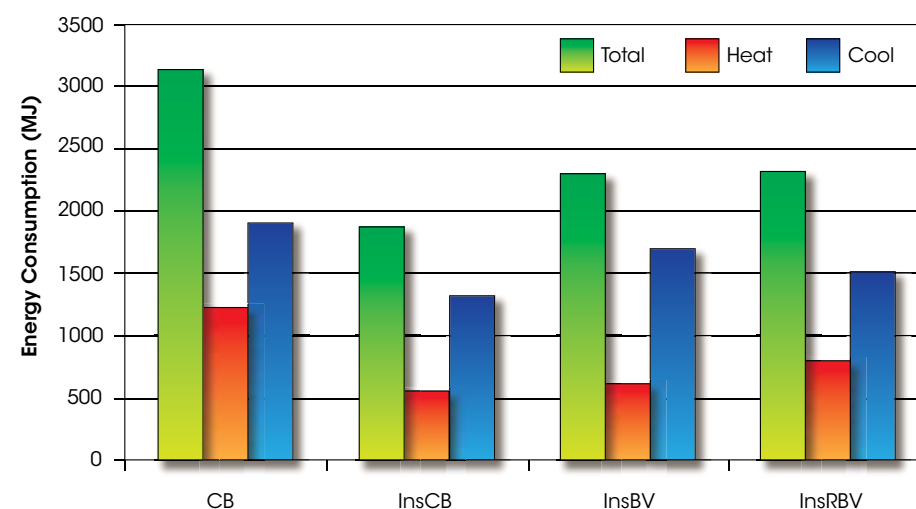
The goal for designers who wish to increase energy efficiency is to maximise internal mass where passive design will allow this mass to moderate temperature. Building internal partition walls of brickwork, particularly in and adjacent to the living areas of the building where most heating and cooling loads are incurred, can give a boost to energy efficiency. By comparing constructions of hybrid wall types, the research showed that significantly improved thermal performance could be achieved.

**Insulated walls** The Newcastle research illustrates the value of insulating between the external and internal skins of brick walls to impede the transference of unwanted heat through the external skin on hot days, and preserves the warmth or 'coolth' retained by the thermal mass on internal skins.

**Windows** Glazed windows and doors, in thermal terms, are holes in the wall, allowing unwanted heat loss in winter. The research showed the addition of glazing can also add unwanted heat loads to internal and external wall faces in summer. Careful placement, sizing and shading are needed to maximise thermal comfort in rooms while still allowing for views and natural light.

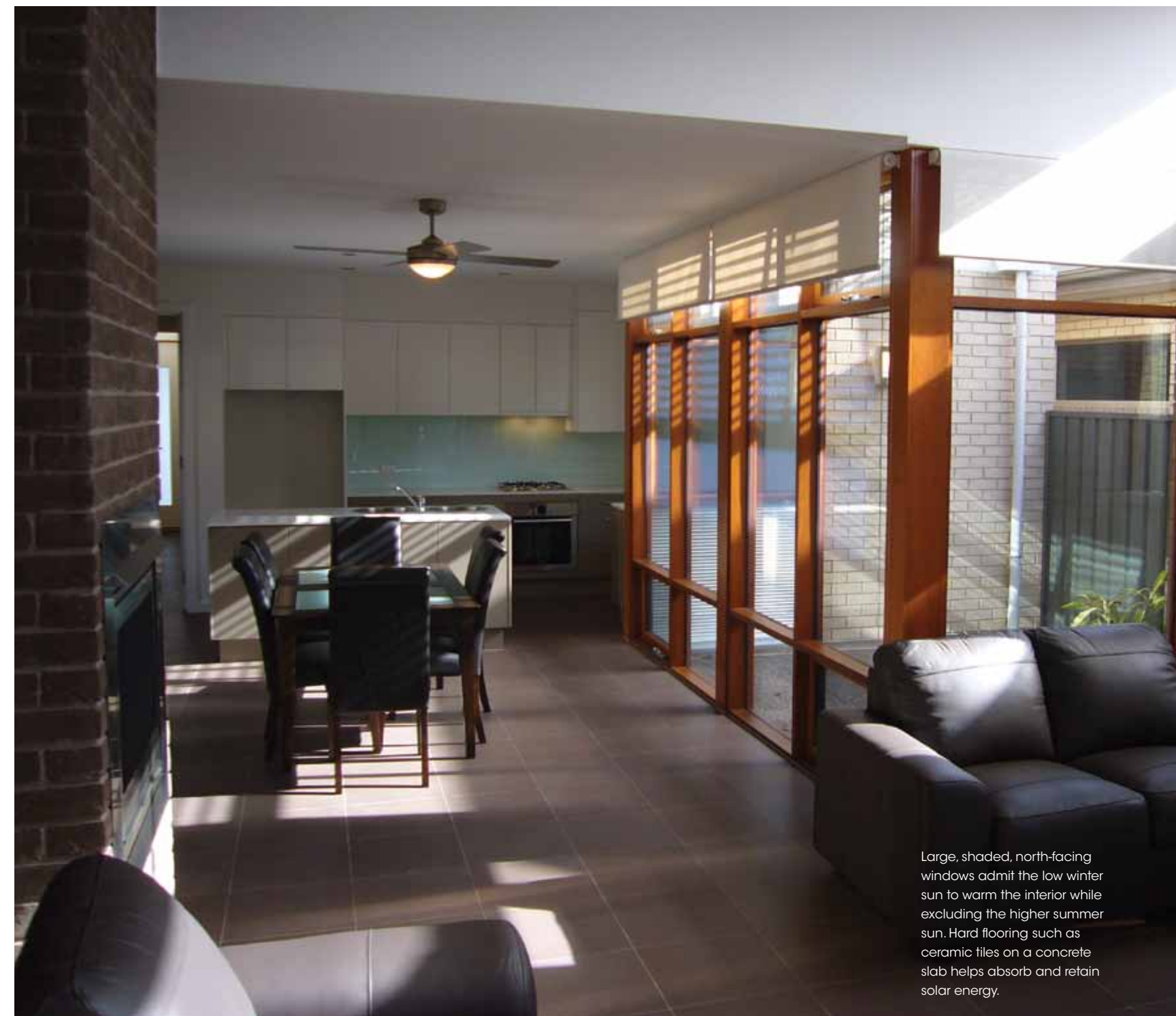
**In warm climates** The research noted the considerable amount of heat radiated back into the environment by the exterior face of brick walls. This can be assisted further by the use of light-coloured bricks to reduce heat absorption and shading external walls to limit the amount of direct sun.

To allow for the night purging of built-up daytime heat, the design of cross-ventilation should consider openings that can be left open without breaches of security or the penetration of inclement weather, insects or rodents. Windows for cooling that can't be left open will potentially compromise the value of the thermal systems.



**Figure 2:** Combined total energy consumption (all seasons) for the four test buildings at The University of Newcastle. The heating and cooling demands in the insulated cavity brick building were the lowest, followed by insulated brick veneer.

(Source: Energy Efficiency and the Environment: The Case for Clay Brick, published by Think Brick Australia.)



Large, shaded, north-facing windows admit the low winter sun to warm the interior while excluding the higher summer sun. Hard flooring such as ceramic tiles on a concrete slab helps absorb and retain solar energy.

**In cool climates** Using brickwork to harness the free heating of low-angle winter sun requires appropriate northern glazing. Adequate glazing to the north is important to allow the penetration of low winter sun to warm internal thermal mass. Windows on the southern façade cannot take advantage of winter sun and only add to heat loss in winter.

**In cold climates** If solar gain is insufficient, the thermal mass of the external walls can drain internal heat if not designed well. Insulation of the exterior masonry walls and careful design to avoid thermal bridging are needed for these environments.

## Further research

The work of The University of Newcastle research team is ongoing. The team is currently analysing the impact of curtains on windows, carpet on floors, the construction of partition walls and the difference between horizontal and vertical format thermal mass.

The hard data gathered from first principles testing of the test buildings has contributed to the development of a computer modelling tool called NUMBERS. This tool is able to model various formats of brick construction in order to measure the impact on thermal performance. The hope is that this work will contribute to future upgrades of Australian thermal-performance modelling engines.

The University of Newcastle report and 'Energy Efficiency and the Environment: The Case for Clay Brick' are available for download from Think Brick Australia ([www.thinkbrick.com.au](http://www.thinkbrick.com.au)).

Also recommended is the 'Energy Smart Housing Manual' published by Sustainability Victoria ([sustainability.vic.gov.au](http://sustainability.vic.gov.au)), chapter six of which focuses specifically on thermal mass.



# Street Life

Brisbane architect James Russell calls for houses to re-engage with the street

Houses in Brisbane's pre-war inner suburbs are compact, with small setbacks and open verandahs resulting in loved and active streets. This is a very different approach to the inward focus of so many contemporary houses.

To encourage a return to this engagement in new estates and subdivisions, projects are needed that demonstrate a renewed level of engagement.

## Making place in the scale of the suburb

On what was once semi-rural land between Brisbane and Moreton Bay, there now stands the suburb of Wakerley, a series of estate developments that have grown up over the past decade.

The streets are empty as we wind our way through one such estate on a 35-degree day. Only the mechanical hum of air-conditioners murmurs in the air, sustaining the people concealed in their houses.

At the end of Bisley Place, James Russell Architect has designed a house that is a solid demonstration of the benefits of opening to the street. In contrast to the surrounding empty streets, children here are running to and fro; not just the inhabitants, but neighborhood children, visitors from across fences.

The aroma of fresh cooking carries unobstructed on the breeze from courtyard to curb. The ritual of cooking and meals happens right here on the street edge, a place for community. Building outdoor circulation through sites and along boundaries also allows for enjoyment of south-east Queensland's benign climate.

This is the new house; not merely a dwelling place for individuals and families, but an interface at which habitat, street and the many rooms within a house can fuse and play.

### Quick Facts

#### **Bisley Place House**

**Location:** Wakerley QLD

**Architect:** James Russell Architect

**Structural engineer:** AD Structures

**Builder/bricklayer:** Crocker Builders

### Featured Products

Austral Bricks® Burlesque® Chilling Black fully-glazed bricks

Austral Bricks® Metallix® Emery bricks

Recycled heritage bricks

## Redefining boundaries

The insular "hot boxes" common to estates are not the fault of builders and property owners. Covenant writers — those charged with maintaining the consistency of the estate — prescribe minimum total floor area, garage space, façade materials, and roof pitch.

The result? Large structures with consistent roofs, left-over strips of landscape and entryways wedged in beside double-car garages. This is uniformity at the cost of people and place.

But imagining between the lines of a building covenant presents another opportunity: that of the covenant as palette only. From this, spaces and materials can be put together in ways that optimise places for the people who use them.

## The ins and outs

Redefining the concept of place is crucial if we are to create shelters that exploit both the local climate and the benefits that community living conveys.

At the Bisley Place House, the outdoors and the indoors cease to be separate. The envelope is robust and permanent, with adaptable glazing, walls and landscape. Structural face brickwork and concrete make up the dwelling's outer sleeve. These are materials that are inherently strong, self-finished, and can withstand diverse and exceptional weather conditions.

The inhabitant is therefore able to create and recreate their own space by manipulating skins — doors, windows and curtains — to alternate between internal and external use.

Four large screen doors provide a veil to the street and admit gentle breezes as they build throughout the day. With a push of a button, these doors tilt open to provide shade and threshold, and create an opportunity to initiate conversation with the street. Curtains are drawn to enclose space or redefine a threshold.

Incorporating the outdoors into the indoor living spaces and establishing circulation throughout the entire site allows the dwelling to breathe and to merge seamlessly with its environment. The house becomes a series of spaces along a passage, a journey that encourages relationships between people and their shared landscape.



## The house, the body

Brick is a diverse material. As a core structure, it may not only face a building but can be the structure itself: the "visible bones."

Systems to maximise the functional potential of brick by managing the flow of water through structural brick walls were developed for the Bisley Place House. The ground level brickwork is laid in a Flemish bond (with alternating brick headers and stretchers).

The combination of fully-glazed bricks and Porters A1 mortar with a waterproofing additive on the front elevation and sleeping areas will ensure these walls remain watertight. The side elevations at ground level are clad in conventional bricks.

Single-skin brick walls laid in a conventional stretcher bond construct the attic spaces, generating an expanse within the dwelling that is intentionally raw and technically outdoor. This is a place for dreaming, reading, for study, making music, for contemplation. Moisture penetrating this upper level walling is captured and drained through weepholes.

The roof meets the 22.5-degree requirement of a local covenant but without gables, twists or turns. There is no visible roof to speak of: it simply slopes down to a central courtyard, protecting the outdoor edge. And within the roof is a magical space — a veritable opening to the sky.

## The result

Thick foliage flourishes around and within the glazed black brick dwelling, a home that both welcomes the landscape and protects its inhabitants, with simple control and flexibility, from undesirable elements.

The materials and making of space is honest and efficient, a nod to the functionality of industrial building. But, more significantly, the dwelling manages also to return to the original definition of a home: a unity with place and environment, a coalescence of community.

James Russell is a registered architect and builder based in Brisbane specialising in houses that encourage the occupants to interact with the environment and neighbourhood.

**previous page.** Adaptable glazing, walls and landscape blur the boundaries between the outdoors and indoors.

**this page.** The Bisley Place house combines a robust envelope with an openness that welcomes engagement with the street and encourages circulation throughout the site, not just the house.



## New Studios are transforming the role of brick in architecture

Brick sales and display centres have traditionally serviced outer suburban greenfield developments. In response to the demands of an increasingly sophisticated market, they have evolved to feature more life-like presentations and greater use of indoor displays in recent years.

Austral Bricks® and its associated companies have now taken the next big step and created two new gallery-like Studios in Sydney and Melbourne that are focused at architects and the inner-urban market.

While there is still a place for Design Centres servicing estate developments, in both Sydney and Melbourne there are an increasing number of inner-suburban redevelopments, especially knock-down/rebuilds, and a booming market in redevelopments and high-end, architect-driven construction.

The place of bricks in architectural projects has been transformed by recently-developed premium product ranges such as Elements®, Burlesque® and Dynasty®, and innovations such as Brick Art™.

The newly-opened Sydney CBD Design Studio and Melbourne Brick Studio are located, staffed and equipped to work with architects, builders and their clients. They showcase not only bricks but also pavers, masonry, roof tiles and timber from across the Brickworks Building Products™ group.

# INNER CITY CHIC

# SYDNEY

## STYLE IN THE CITY

The Sydney CBD Design Studio was opened by City of Sydney Councillor Shayne Mallard. The spectacular event included a grand piano, singers and dancing girls delivered to the door in Austral Bricks trucks with drivers in tail suits instead of their usual Stubbies! Despite the unseasonal weather, there were over 150 attendees drawn from Sydney's architectural and building fraternity.



Located in a ground-floor retail space in stylish Carrington Street, the Sydney CBD Design Studio provides a retail presence but is also well placed for the many architectural practices and major builders located in or around the city centre.

From the street this could be a high-end gallery and upon entering this perception is reinforced. The showroom area is dominated not by product displays but two brick feature walls that have a strong "wow factor." The "Illusions Wall" made from Bowral Bricks® Charolais Cream bricks, fans out in three dimensions while the "Grunge Wall" pays tribute to the area's industrial past.

Both walls and the minimalist interior were designed by Siren Design Group. The attractive flooring is Wormy Chestnut™ from Auswest Timbers®, part of the Brickworks Building Products group.

Most products are discretely stored in cabinets and brought out onto one of the large work benches as required. This allows the staff to work with clients and help refine their selections.

Architects are encouraged to bring their clients and use the well-equipped boardroom. The facilities have also hosted industry events, such as AIA gatherings.

The CBD Design Studio is located at 50 Carrington Street, Sydney, close to Wynyard Station. It is open from 9 am 'til 6 pm weekdays and 9 am 'til noon Saturday, other times by appointment. Telephone 02 9830 7380.



# MELBOURNE

## INDUSTRIAL FLAIR

For its grand opening, the cavernous showroom of the Melbourne Brick Studio was converted into a nightclub with thumping music, smoke machines, moody uplighting and canapés served in the core holes of bricks!



Photography: Roger du Buisson

It's often said that Sydney and Melbourne are as different as they are alike. And the new Melbourne Brick Studio in inner-city Richmond is a perfect example of that.

The location, in fashionable Swan Street, is surrounded by upmarket building product and homewares vendors (and down the street from Melbourne's Ferrari and Maserati showroom). Richmond is also the home of many leading architectural practices.

The venue is not a glass-fronted shop but a large warehouse that has undergone a metamorphosis under the guidance of Tim Black, the B of BKK Architects. Like the Sydney Design Studio, there is an identical "Illusions Wall" feature but that's where the similarity ends.

Out front is a low brick wall with a denotated and stepped pattern that has been dubbed "playful" by one commentator. It is also functional, having been used as a convenient seat by pedestrians!

The Brick Studio's theme is that of a gallery rather than a display centre. The industrial theme is reinforced by the use of "raw" materials: brick, concrete and timber. Dominating the display area is a forest of towering brick columns flanking a massive work bench made from timber supplied by Auswest Timbers®. As in the Sydney CBD Design Studio, most products are stored and brought out to allow staff to work directly with the customer.

As well as being convenient for visitors from the local area and Melbourne's CBD, the Brick Studio is close to the Monash Freeway and CityLink. Like its Sydney sibling, it is well equipped and available for industry functions and presentations.

The Brick Studio is at 490 Swan Street, Richmond and open 9 am 'til 5 pm weekdays and 10 am 'til 4 pm Saturdays, other times by appointment. Telephone 03 9303 4740.





# KING HIT

Sydney architect Jon King discusses the challenges and rewards of designing a family home in one of Australia's most densely populated suburbs.

**With natural advantages of orientation and prospect, one suspects that prior to the arrival of Europeans, Elizabeth Bay was a sunny, protected and abundant place for the indigenous Gadigal people to live and commune.**

In 1826 Governor Darling granted Elizabeth Bay to Alexander Macleay. Soon after, a sea wall was built across the bay establishing an estate of 54 acres featuring the beautiful Elizabeth Bay House, which some say is the finest house in Australia.

The site for our project was a later subdivision of the original estate and over time a dense city has grown up around this quiet harbour beach. Today Elizabeth Bay is among Australia's most densely populated and highly-urbanised areas.

To build a house on this site was a privilege but also a significant challenge for both the architect and builder. Planning and construction was complicated by the site's narrow width, its limited use set by covenants and easements, and very restricted access.

Added to this were the presence of heritage buildings and landscape features on or adjacent to the site, and simply the density of population living in apartment buildings surrounding and overlooking the site.

Our client wanted a house that would add positively to the streetscape and connect the occupants to this rich and varied context while also providing a private and secluded inner world. It was to be a modern house beautifully crafted with excellent materials and finish but with an ancient air.

**previous page.** The choice of face brick for internal display was "an honest expression of the way [the house] was built" contends the architect, Jon King.

**from left.** A restrained palette of brick, timber, brass, steel and copper features throughout the interior. The bricks are a slim 50mm high giving a more finely "knit" appearance to the walling.

The plan of the three-level house with its wide central hallway, inner courtyard and double-height verandah to the north, gives visual transparency and connection to the rich surrounds, allows cross-ventilation, and offers protection from sun and rain. But most importantly it allows a real sense of enclosure and privacy.

The project also included the integration of a heritage-listed boatshed, a pool and facilities and significant landscape works.

Although Elizabeth Bay is full of fine brick buildings the choice of brick was driven primarily by the aim to build a structure of a timeless quality that would weather and age with dignity. The primary architectural elements that define the house are insulated 320 mm-thick loadbearing brick walls comprising two leaves of 110 mm brickwork separated by 50 mm of insulation and a 50 mm cavity. They provide thermal mass and visual and acoustic privacy and have a visual weight and density that defines rooms both inside and out. Importantly, their warmth, colour and character complement the other building materials and details.

I wanted the house to be an honest expression of the way it was built. The loadbearing walls are of brick and so they are expressed inside and out. I also wanted to visually diffuse the relationship between inside and out, so we restrained the palette of materials used to brick, timber and brass, and they literally run everywhere.

The next layer of interior furnishings can work off this very restrained backdrop. But it was a real challenge for everybody involved to get the tolerances, dimensioning and setout of the brickwork such that this was possible. Also critical was the mix of colours. A great deal of planning and material handling was required so that the spread of colour and texture present in each palette of bricks was seamlessly integrated.

The slim 50 mm bricks were chosen because the proportion very subtly broke down the vertical scale of the structure and the walls. The finer scale also allowed



Photography: Brett Boardman

us to get a richer and denser mix into these sometimes three-story monolithic elements.

The horizontal emphasis pushes the eye outward drawing-in the external spaces and connections that are so important to the house. The harbour, pool and garden are drawn into the interior spaces.

Between the brick walls and forming the balance of the facade are beautiful western red cedar panels sometimes nine meters high. They act as cladding, window and furniture simultaneously, providing for ventilation, light, view, privacy, and storage and services. Beautiful brass, timber, steel and copper elements complement the brickwork and cedar. Most of these elements and fixtures were custom designed for the project and fabricated by local contractors and tradespeople.

The house also includes the latest technology and environmental systems. Water storage, grey-water recycling, energy-efficient heating and cooling systems, lighting control and automation, security, access control and entertainment

systems are all the most up-to-date. However they are not overtly expressed; great care has been given to invisible integration with easy and direct interface.

In all, the house attests to a significant collaboration between architect, builder and the many contractors and artisans required to build a house of this complexity. It confirms a belief in the handmade, the crafted and the local, a process underpinned by a client willing to trust in this collaboration and to appreciate and understand the significance of the project and its aims.

**Jon King** is principal of Design King Company, a leading Sydney architectural and design practice. He studied industrial design before completing his architectural studies at the University of Technology, Sydney where he was awarded the University Medal, the NSW Board of Architects Medallion, the Kann Scholarship and the RAI NSW Chapter Prize. He also lectures and is a frequent contributor to a number of major newspapers and blogs at <http://news.domain.com.au/blog/myapad>.

### Quick Facts

**House in Elizabeth Bay**

**Location:**  
Elizabeth Bay NSW

**Architect:**  
Design King Company

**Structural engineer:**  
Chapman Hutchison

**Builder:**  
Bellevarde Constructions

**Bricklayer:**  
MJM Brick and Blocklaying

### Featured Product

Bowral Bricks® Bowral50®  
Gertrudis Brown  
dry-pressed bricks

"The choice of brick was driven primarily by the aim to build a structure of a timeless quality that would weather and age with dignity"

# School's in for Sustainability



## Quick Facts

### Katitjin Centre

**Owner:**  
Australian Institute of Management

**Location:**  
Floreat WA

**Architect:**  
Cox Howlett & Bailey  
Woodland

**Structural engineer:**  
Capital House Australasia

**Builder:**  
PS Structures

## Featured Products

Austral Precast® concrete wall panels

Photography: Alison Paine

A new management educational facility in Perth is providing a practical example of the benefits of sustainable building to management students.

**Thanks to leading edge design and careful selection of materials, the Australian Institute of Management's Katitjin Centre is the first in Western Australia to achieve a 6 Star Green Star Education Design v1 certification.**

The centre is located on a leafy campus in the suburb of Floreat and draws management students from industry, commerce and government. The three-level building has a gross floor area of 1400 square metres and incorporates nine training rooms, two syndicate rooms, lounge and breakout areas, networking and meeting facilities, and basement car parking.

The design adopts simple architectural forms drawn from the existing campus. "The building responds to the sloping campus topography and existing verdant landscape," says Cox's project architect John Lee. "Extensive use of glazing affords views to a natural bushland reserve adjacent to the site. A covered walkway to the north provides sunshading and entrance protection while establishing a pedestrian spine across the site."

A double height entrance combines with extensive use of glazed partitions and operable wall to give the interior a light and airy character.

The Australian Institute of Management's Katitjin Centre in suburban Perth has achieved a 6 Star Green Star rating without compromising the aesthetics or building operation.





(Clockwise from left) The Centre's internal spaces are open and inviting, with extensive glazing affording views of the leafy campus. The concrete panels are crisply detailed with pencil round edges. The panels were designed and installed using accessible stainless steel bolts to allow ready disassembly. The thermal mass of the panels make a substantial contribution to the building's energy efficiency.

Precast concrete panels were specified for the project. The financial benefits of this offsite manufacturing process – faster construction leads to earlier occupancy and reduces the time capital is tied up – are well accepted. Precasting also added to this project's green credentials on a number of levels.

"The precasting process is performed under controlled conditions in reusable moulds," explains Yuen Leow, WA sales and marketing manager of Austral Precast which manufactured the centre's concrete wall panels. "This ensures minimal waste and optimises the consumption of cement, steel and water. And in this case we were able to use fly ash, an industrial waste product, as a substitute for 20 percent of the cement. This actually increases the product's long-term strength and durability."

Because they are locally manufactured, the transport costs for precast panels are minimised and once onsite they can be quickly craned into position. The panel connections for this project were carefully designed to allow disassembly of 95 percent of the facade, with recoverable elements being clearly marked and listed on a disassembly plan.

Thermal efficiency was also a key component of the centre's sustainability initiatives. The building utilises the four principles of passive design: orientation, ventilation, insulation and thermal mass. Precast concrete panels have a high mass which helps moderate temperature fluctuations and reduces the need for artificial heating and cooling.

The concrete panels, crisply detailed with pencil round edges, create an attractive, robust building envelope that requires minimal maintenance. "Precast concrete was selected for its robust, durable nature and high-quality paint finish that is consistent with the existing campus palette," says John Lee. "It contrasts well with the transparency of the glazing." Precast panels were also used internally.

PS Structures project manager Nathan Phillips said construction guidelines ensured all panels and bolting aligned, making site installation simple, quick and easy. "The precast panels are a mixture of walls and sills which are fixed by bolting, using stainless steel bolts that remain accessible." This is part of the disassembly plan that allows panels to be demounted and reused or recycled without demolition.

These initiatives and others such as roof-mounted photovoltaic panels and an HVAC system using variable air volume, ensures the centre is emissions-neutral, meaning it produces as much operational energy as it consumes. The campus also features a 42 kilolitre rainwater tank and a low-water 'xeriscape' garden.

The project cost \$13 million which included a sustainability premium of 10 to 15 percent. AIM WA's executive director, Patrick Cullen, said that "during the tender stage we put out options for both a 5 Star and 6 Star rating. There was relatively little financial difference between the two, reinforcing our desire to target the higher 6 Star Green Star rating."

Darrell Williams, director of building services engineers, Norman Disney & Young: "From a design perspective, what's remarkable about this building is its achievement of a 6 Star rating without compromising the aesthetic value or usability of the facility. The building achieves its targets subtly, yet delivers a dynamic overall impact."

The Katitjin Centre sets a high sustainability pass mark for other educational facilities across Australia and around the world. More importantly, it will present an operational example of the benefits of a sustainable building design for its influential students to take back to their workplaces.

Xeriscape™ is a trademark of Denver Water.

# In with the OLD

Art and redundant infrastructure are reshaping London, reports Gerry McLoughlin, architect and urban designer.

**With the 2012 Olympics around the corner, London has turned up the heat on architectural dazzlers. A number of important projects that have recently been built, commissioned or are subject to design competitions. Interestingly, these projects often focus on adapting existing industrial or infrastructure 'cathedrals' to new contemporary uses.**

Durable materials and sustainable building performance are key considerations for many of these projects.

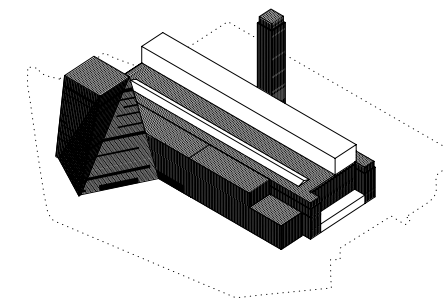
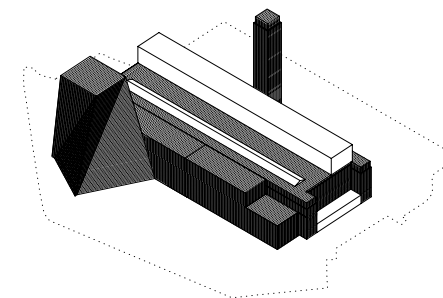
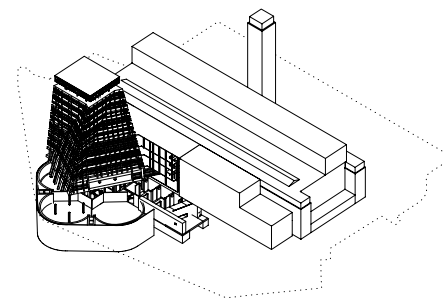
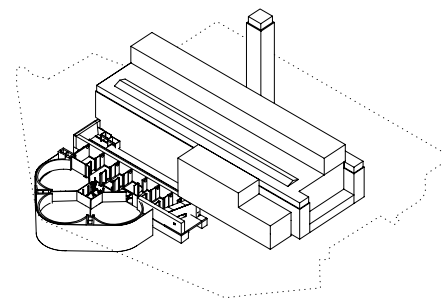
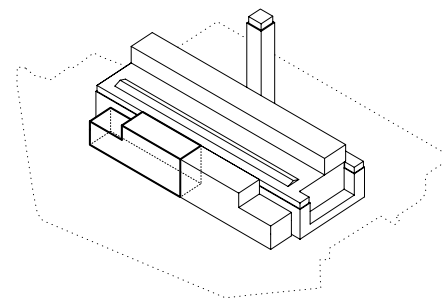
Herzog and de Meuron's Tate Modern is a wonderful example of a recent project where repurposing infrastructure of a different age has breathed new life into a part of the city that needed it.

Originally built in two phases between 1947 and 1963, Bankside Power Station was designed by Sir Giles Gilbert Scott who also designed Battersea Power Station, Liverpool Anglican Cathedral, Waterloo Bridge, university libraries in Oxford and Cambridge, and the famous British red telephone box.

Between 1981 and 1994 when the Tate Gallery acquired an option on the site, the building remained unoccupied, apart from a London Electricity sub-station that still remains.

The redundant power station proved an astonishing discovery; a building of enormous size and architectural distinction, superbly sited opposite St Paul's Cathedral and in a fascinating and historic if neglected area next to the new Globe Theatre. An international architectural competition was held, attracting over seventy entries.

The final choice was a young Swiss practice founded in 1988 by Jacques Herzog and Pierre de Meuron. They have received international acclaim and awards for their innovative work, including the Pritzker Prize in 2001, the RIBA Stirling Prize in 2003 and the RIBA Gold Medal in 2007.





**previous page.** (top) Artist's impression of the Tate Modern extension from the south (© Hayes Davidson and Herzog & de Meuron). (below) The transition from switch-house to Tate modern extension (© Herzog & de Meuron).

**this page.** (top) The Tate Modern is housed in the former Bankside Power Station. (Photo: Greg Bartley.) (below) Artist's impression of the East Tank in the extension (© Peter Saville, Hayes Davidson, Herzog & de Meuron) and a detail of the perforated brickwork design and horizontal windows on the new building (© Herzog & de Meuron).

Architecturally and in urban design terms, the Tate project has repositioned London to extend its reach to the south of the Thames, necessitating the design of an important pedestrian bridge which has created a completely new and walkable experience of London, and revitalised Southwark.

The global interest in the Tate Modern has seen the need for an extension. "The old Tate receives around two million visitors a year, the National Gallery receives four million and the British Museum receives five million so we expected two to two-and-a-half million visitor a year," says Tate director, Sir Nicholas Serota. "(In the) first year we got five million, so any visitor to the site knows that we are overcrowded and that we need to extend."

The opening of Tate Modern in May 2000 was intended as the first stage in the development of the former Bankside Power Station. It was always envisaged that the derelict oil tanks and the switch station to the south of the site could eventually be integrated into the gallery.

The electrical switch station is still used to power a large part of the City and South London. EDF, who own the station, are modernising their equipment so it will take up a smaller part of the building. This provided the ideal opportunity to expand Tate Modern, with the oil tanks forming the foundation of the new building.

The world awaits this splendid new project, currently under construction on the south side of the Tate, which will present a striking combination of the raw and the refined, found industrial spaces and twenty-first century architecture.

There are many fine elements to the design of this project. The façade will use brick to match the surface of the existing structure while creating something radically new: a perforated brick lattice through which the interior lights will glow in the evening. Windows and the terrace will appear as cuts in the brick surface. The building will rise 64.5 metres above ground in 11 levels, its height responding to the iconic chimney of Giles Gilbert Scott's power station.

"The use of brick is not cool which is the reason we jumped on it for a project like this because it meant this building would stand alone," says Jacques Herzog.

If the Turbine Hall was the defining emblem of Tate Modern's first stage, the vast oil tanks at the base of the building will become as closely associated with the new building. These raw industrial spaces will retain their rough-edged atmosphere to become an unforgettable performance and exhibition venue.

Beautiful new galleries displaying the collection will have a greater variation of sizes and shapes than the original museum, and there will be a larger space for temporary exhibitions.

Tate Exchange will enable groups to exchange skills and ideas, there will be new seminar spaces, and a cutting-edge Media Lab. Social spaces will include a new Members Room, a Level 10 restaurant, and a public terrace on Level 11, all with outstanding views across the capital.

The new building will also be a model of environmental sustainability, setting new benchmarks for museums and galleries in the UK. It will draw much of its energy needs from heat emitted by EDF's transformers in the adjoining switch-house. With a high thermal mass, frequent use of natural ventilation, and utilisation of daylight, the new building will use 54 percent less energy and generate 44 percent less carbon than current building regulations demand.

A public walkway through the building will make possible a direct route from the City to the heart of Southwark. There will be two new public squares to the south and west of the building. To the east, a new planted area will be created.

The Substation Utility Building, still an active but diminished power station, has been repurposed into infrastructure for this year's London Olympics. The lattice pattern of the upper-level brickwork helps soften the monolithic character of the building. (Photographs courtesy Olympic Delivery Authority.)

## Substation Utility Building

Another fine project completed early in the London Olympics program is the Substation Utility Building for London's Olympic Park by Glasgow Architects NORD Architects, winner of the prestigious RIBA Awards for Architectural Excellence.

In 2007 NORD were appointed to work with the Olympic Delivery Authority to develop a strong contextual approach to a key utility building within the Olympic Park. The building, completed in January 2010, is not designed for an event in its own right but as one of a number of buildings that form the fabric of the Olympic site, having permanence weight and dignity.

Strong emphasis was placed on ensuring that the structure fits in with the design of the wider Olympic Park. Externally, the architecture creates a sense of solidity appropriate to the building's key role in the utilities infrastructure in the Olympic Park. The 130,000 bricks used in the design also reflect the traditional use of dark brick stock in window and corner details on the former Kings Yard industrial buildings on the site.

At 80 metres long and made from ebony black brick, the substation is legible at first as one uninterrupted surface; however the envelope is a more open lattice than it appears. In lower sections, the brick performs as a loadbearing structure, in others simply as a skin and in the upper sections it permits ventilation for the internal transformers.

Across the length of the building, the height varies - the eastern tower was designed to be lower in height, facilitating a viewing corridor to the Olympic Stadium in the south-west, as well as a view to central London, St Paul's and the Swiss Re tower.

Sustainability is at the heart of the substation design through the reuse of materials from the demolition of the former Kings Yard buildings. The building also includes a 'brown roof' which will allow species to naturally colonise the site, enhancing the ecological value and biodiversity of the Olympic Park site by attracting local wildlife. The roof's weight supplements a blast protection strategy, one of many technically-demanding aspects of a challenging brief.

This phenomenon of repurposing buildings of the past, particularly of the scale and design quality of the Bankside Power Station, is something that is occurring in many major cities: Sydney's Museum of Modern Art at Circular Quay, Madrid's CaixaForum and the Musée D'Orsay in Paris being just three examples. This tells us something about how we in the modern world view ourselves. It is a gesture of democracy that we do not demand purpose built, but are content to adapt edifices of the industrial age to present day cultural applications.



# Top of their Game

Completing a project spread over three centuries takes two careers to their peak

**The construction of a cathedral is often a long process. Work on Cologne Cathedral began in 1248 and was only completed, with interruptions, in 1880. Construction began on Perth's St Mary's Cathedral (more correctly the Cathedral of the Immaculate Conception of the Blessed Virgin Mary) in 1865 and was not completed, again because of interruptions and the fluctuation of the economic cycle, until December 2009.**

The original, relatively modest cathedral was designed in the Victorian Free Gothic style by Brother Joseph Ascione and constructed by Benedictine monks in locally-made red bricks and roofed with shingles.

In the mid-1920s it was decided to greatly extend the cathedral in an Academic Gothic style designed by Michael Cavanagh. The original building was largely retained as the nave (congregation area) of the expanded church. The link between the two very different architectural styles, let alone their different heights and proportions, was less than successful. Before the work was completed the Great Depression hit and completion of the building languished for the next seven decades.

Fast forward to 1999 and a bequest of \$2 million kickstarted a program to not only complete the cathedral but redevelop it into a facility more suited to 21st century liturgical requirements. Perth architect Peter Quinn, a solo practitioner assisted only by a drafter, Trevor Osborne, won an invited design competition and began the defining project of his career.

"To have two church buildings not designed to link together and then to cut a slice out of the two and to join them, I don't think you could get anything harder," he told Channel 10 News before the opening.

## Quick Facts

### St Mary's Cathedral

**Location:** Victoria Square, East Perth WA

**Owner:** Catholic Diocese of Perth

**Architect:** Peter M Quinn Architect

**Structural engineer:** BG&E

**Builder:** Emco

**Roofing contractor:** Bristle Roofing

## Featured Products

Bristle Roofing™ Marseille profile terracotta tiles in Copper Blaze

“To have two church buildings not designed to link together and then to cut a slice out of the two and to join them, I don’t think you could get anything harder,”

Quinn arrived in Perth in the mid-1970s, en route to Melbourne after working overseas. “The sky was blue and the beach was empty so I ended up staying here.” Although he initially worked on more conventional projects, Peter has specialised in churches and schools in his later career.

He decided to retain as much of the 1865 building as possible: the entry porch, two typical bays and the defining spire. “I thought anything less would be just tokenism.”

An important part of the brief was to increase the seating capacity and improve sightlines. The solution was to insert a new semi-circular section between the 1865 and the 1930 structures, thus creating a sensitive transition between the two buildings and providing a much enlarged nave with uninterrupted views of the altar from three sides.

“I couldn’t copy what was there because it’s two different styles for a start,” he says. “And I didn’t want the new work to compete with the old, a ‘look at me’ statement, but I wanted it to respect the existing fabric and be a harmonious link between the two.” The precast concrete structure is glazed behind the colonnades, contrasting with the solidity of the older sections.

The cathedral also functions as a local parish church but had very limited administration or ancillary-use facilities. Quinn was anxious to retain the square’s openness and chose to underground the meeting rooms, social areas, music practice rooms, offices and conference rooms.

The 1930 section, originally tiled, was reroofed in a Marseille-pattern terracotta tile from Bristle Roofing which also removed the old tiles and installed the new roofing system.

Supervising the project for Bristle was John Rawlins, who as a 15 year old apprentice, worked on the cathedral’s reroofing in 1961. He was a “wire boy” tying off copper wires attached to a lug on the underside of each tile, a process superseded by nailing.

The building was fully scaffolded and the old tiles stripped. Both Rawlins and Quinn were surprised at state of the roof timbers. “The

**previous page.** Successfully linking the original 1865 cathedral building to the much larger 1920s extension was the challenge of his career for Perth architect Peter Quinn.

**right.** The previous unsympathetic link between the old and new buildings was demolished. The new link not only blends the two very different building scales, but also brings in light, expands seating capacity and improves viewing. The roof was fully scaffolded to allow double sarking to be placed and new tiles fixed over the original roofing timbers.

timber was in beautiful condition,” recalls Rawlins who has since retired. “It was impractical to reuse the old tiles although they were still in excellent condition.” The end trusses were tied back to the gables to improve rigidity, a concession to the code introduced after the disastrous 1967 Meckering earthquake.

Water penetration had been a problem with the old roof, partly because of its 50 degree pitch but mainly because the roof was not sarked and the adjacent Royal Perth Hospital complex creates a wind corridor that blew rain under the tiles. The solution was to place a double layer of sarking by half overlapping. New hardwood battens were fastened and the tiles, all 20,000 of them, laid and nail-fixed by a team of ten.

The colour chosen was Copper Blaze, a dark brown terracotta tile with subtle shadings of lighter browns, a non-standard colour custom-made for the project.

The 1865 section was reroofed in slates, an acknowledgement of its heritage. The cathedral entry was paved in porphyry granite cobblestones. A new spire in stainless steel sits alongside the old slate-clad spire.

Despite original concerns from the Heritage Council of Western Australia – including that the new spire not “shamelessly mimic” the old – the project was a finalist in the council’s 2011 Western Australian Heritage Awards.

St Mary’s Cathedral also won WA’s top architectural award in 2010, the George Temple Poole Award. “The finished building tells its own story through the superb detailing and sensitive relationship of the old to the new” said the jury which also described it as “a delightful master work of public architecture.” It was also awarded the Jeffrey Howlett Award for Public Architecture (WA) and the Australian Institute of Architects Award for Heritage (WA).

Not surprisingly, Peter Quinn considers St Mary’s Cathedral to be the pinnacle of his career and “a very hard mountain to climb.” For John Rawlins, it could be said that he began his working life at the pinnacle, scaling the roof of one of Perth’s defining buildings as a youth and returned to it at the zenith of his career.



Photography: Main images by Ron Tan Photography, courtesy Roman Catholic Archbishop of Perth, construction image by John Rawlins.

# 3 x 1 x 1

## Three schools. One architect. One cladding system.

**Schools, public and private, are the bread and butter of many architectural practices, providing a steady source of project work.**

Education sector budgets are usually tight and client expectations can be high but the result is often more than just financially rewarding as the designer's work may be on display for generations to come.

Perth-based CHRISTOU Design Group has completed three major projects that share a single cladding system: Terraçade terracotta facade system, developed in Australia by Austral Facades™, part of the Brickworks Building Products group.

At the core of the system are 600 x 300 mm fired terracotta tiles that are captured on aluminium rails fixed to battens over the underlying wall structure, which may be a building frame or a structural wall such as precast panels or blockwork.

The result is an attractive, durable, low maintenance, self-finished wall surface that is tested to Australian Standards for water penetration and wind loadings. Terraçade tiles are fully reusable and most system components are recyclable.

We asked CHRISTOU's director Murray Johns what attracted him to Terraçade in the first instance. "Aesthetics, the fact that it's a natural material, the simplicity of the system, its low maintenance and quality image," he responded simply.

As well as the three educational projects shown here, CHRISTOU has explored the application of Terraçade in Perth's Claremont Quarter, a \$300 million commercial/retail/residential development.



**from above.** Terracotta facade panels add texture, character and scale to what was previously a hard, Brutalist-style 1960s building. The building repurposing improves transparency and brings the internal facilities into line with contemporary education expectations.



### Wesley College

The Joseph Green Centre at Perth's Wesley College was designed in 1968 and constructed in three stages. The concrete-framed structure was sound but the brick-clad Brutalist style was at odds with the campus character and the internal design no longer satisfied contemporary education needs.

The exterior required significant remodelling to create an image and scale more in tune with the overall campus. The design increases the building's transparency, most visibly in the strongly-horizontal fenestration and a new stair tower, the signature element on the western elevation, which dramatically improves vertical circulation.

The centre was extended to the north, with the ground floor housing a cafe-style venue creating indoor/outdoor dining options for students. Above are two flexible learning studios that primarily support music.

Brickwork was retained at ground level. The stair tower and some first-level deeply-corbelled brickwork were rendered. The college wanted a low-maintenance, lightweight cladding material for the upper levels which ruled out products that require periodical refinishing.

The Terraçade system offers the benefits inherent in fired terracotta and is suitable for retro-fitting as well as new construction. The Wesley campus is predominantly roofed with terracotta tiles.

The colour chosen for this project, Tanami, echoes this and is towards the red end of the traditional terracotta spectrum.

Internally, the Joseph Green Centre has been comprehensively repurposed with the former studios and workshops remodelled to provide specialist facilities for media studies, science and performing arts, as well as specialist curriculum program centres. The Centre also has an enclosed gallery, an auditorium and staff facilities.

The Joseph Green Centre at Wesley College is testament to the fact that sustainability can be effectively delivered through the adaptive reuse of a well-constructed building.

**from left.** The precast colonnade pillars are clad in Terraçade facade tiles, adding colour and texture. Although the building is largely rectilinear, the complex also features pop-out semi-circular classrooms shaded with Italian-made terracotta louvres.



## Hale School

The Hale School is Western Australia's oldest private boys' school, founded in 1858. Its alumni includes mining magnate Andrew "Twiggy" Forrest whose family name adorns the school's new teaching and learning precinct.

The Forrest Library is at the centre of a cluster of buildings linked by patios and colonnades. The building structure is a concrete frame with glazing and limestone masonry at the ground level and lightweight cladding commencing above the window heads.

As well as a 1500 square metre library, the \$16 million complex houses an IT centre, 27 classrooms, student cafe, meeting rooms, uniform shop and support rooms.

The overall building is rectilinear but punctuated with pop-out, semi-circular classrooms which CHRISTOU describe as "a tool to encourage students to group and collaborate."

Again, Terraçade was chosen as the cladding material for its low maintenance requirements and clean, natural aesthetic which blends with the character of the exiting campus, especially the adjoining brick dining hall. The colonnade pillars are also clad in Terraçade over precast concrete. The colour chosen, Gibson, is again in the traditional terracotta spectrum but more towards orange.

Possibly the most unusual feature of this building is the use of Italian-made extruded terracotta louvres, set at fixed angles and supported on concealed steel frames.

The Forrest Library is a flexible facility that promotes individual and group learning and caters to today's more wide-ranging teaching demands. The selection and detailing of materials demonstrates craftsmanship and quality of the first order.

The Forrest Library won the AIA (WA Chapter) 2010 Design Award for Public Architecture.



## Geraldton Senior College

Geraldton, on the coast 400 kilometres north of Perth, is home to Geraldton Senior College. Established in 1939, the college was in need of updating and CHRISTOU Design Group was commissioned to undertake a series of upgrade projects, commencing with a new library and cafe.

The brief required the new work to have a contemporary aesthetic while respecting the original campus buildings. The concrete-framed structure is clad in rendered masonry to the lower level, while the upper level is framed in structural steel and clad in Terraçade terracotta facade system.

Terraçade tiles are classified as Exposure Grade and are therefore highly suitable for a saline environment such as this. The choice of colour, Tanami, reinterprets the school's heritage character and particularly the terracotta roofing. Despite the harsh conditions, the finish of the facade tiles will endure.

Intriguingly, the design picks up on Geraldton's maritime heritage with a portion of the building cantilevered at a 60 degree angle, implying a ship's prow. From a distance, the building appears to float above the ground.

Engineered details were developed to enable Terraçade to be fixed in the cantilevered sections, replacing the fibre cement sheeting originally specified. Anti-lift-off angles were installed on every tile in the cantilevered sections to prevent uplift movement caused by dynamic wind loads. Anti-rattle sponges were also installed to minimise or eliminate rattling. These unique engineering details were reviewed by Connell Wagner and guaranteed by Austral Facades.

Externally, the former bitumen-paved quadrangle was transformed into a green plaza, sheltered from the prevailing sea breezes. The library and cafe development at Geraldton Senior College creates a more sophisticated and mature zone for students who are on the verge of adulthood to socialise and develop.

Terraçade is exclusively distributed within Australia by Alucobond. More information including comprehensive technical manuals and more design ideas at [www.terraçade.com.au](http://www.terraçade.com.au).



### Quick Facts

**Wesley College Joseph Green Centre**

**Location:** Coode Street, South Perth WA

**Architect:** CHRISTOU Design Group

**Structural engineer:** Maunsell AECOM

**Builder:** Loxam Developments

**Terraçade installer:** Perth Façade Systems

### Hale School Forrest Library

**Location:** Hale Road, Wembley Downs WA

**Architect:** CHRISTOU Design Group

**Structural engineer:** BG&E

**Builder:** Merit Projects

**Terraçade installer:** Thommo's Roofing

### Geraldton Senior College Library & Cafe

**Location:** Carson Terrace, Geraldton, WA

**Architect:** CHRISTOU Design Group

**Structural engineer:** Maunsell AECOM

**Builder:** Cooper & Oxley

**Terraçade installer:** Perth Façade Systems

### Featured Products

Terraçade® TN Tanami (Geraldton, Wesley)  
Gibson (Hale)

**from top.** Defying gravity, the cantilevered "prow" is clad in terracotta tiles, in place of the fibre-cement sheeting originally specified. The lower level is constructed in rendered masonry, leaving the upper storey to appear to float above the ground.

Photography:  
Acorn Studios (Wesley, Hale),  
Graeme Gibbons (Geraldton)

# Rebuilding Bayside

In this upside down house,  
the view's the thing

## Quick Facts

### Beach Road house

#### Architect:

Lowe Architecture

#### Structural engineer:

Shane Ford Engineering

#### Builder/blocklayer:

Low Construction

## Featured Products

Austral Masonry® 10 Series  
concrete masonry:

Split Face Half Height Block  
in Riverstone

Smooth Face Full Block in  
Riverstone

Smooth Face Sill Block in  
Riverstone

Cored Standard Block



"The split face units are a feature, the cedar is a feature and the amount of glass is a feature. The rest you just want to lose."

Photography: Roger du Buisson

**previous page.** The front of the house affords wonderful views over Port Phillip Bay. The living areas are on the upper levels with bedrooms below.

**above.** The main entrance is on the side street, the entry foyer rising the two storeys. The dominant facade material – slim, split-face masonry units – also folds into the entrance.

**Beach Road hugs the upper western shore of Port Phillip Bay, passing through some of Melbourne's most prestigious suburbs. It's the key road in a network much favoured by bike riders who descend on it in their thousands, especially on weekends.**

Beach Road is also a favourite of home owners who appreciate the spectacular bay views, white beaches and numerous yacht clubs. Land values along this popular thoroughfare often outstrip that of their established homes which has led to an active rebuilding market.

The owners of this property occupied a serviceable but unexceptional 1950's house for several years, allowing them to gauge the site and develop their ideas for a new home.

The corner block is located opposite a reserve with views over a small cove with a sheltered beach. It's no surprise then that access to the views is paramount. "Because of the bay views, you want to live upstairs," explains Lowe Construction's Brian Lowe. His company specialises in designing and constructing houses in this area. "So these are the reverse of the usual house, with the kitchen, entertainment areas and master suite upstairs and secondary bedrooms below."

The facade is a blend of cedar, render and sandy-coloured, smooth-face, full-height blocks sitting against a strongly-textured background of half-height, split-face masonry units in the same colour, all manufactured by Austral Masonry. Massive double-glazed windows – said to be the largest installed in a Victorian house – dominate the upper level frontage and overlook a small walled garden.

The main entry to the 63-square house is from the side street and leads into a spectacular double-height atrium. The split face units extend into the entry, flanking stairs and a lift. Their mortar joint finish was carefully chosen. The horizontal (or bed) joints are raked as is conventional practice whereas the vertical (or perpend) joints are flush. The resulting horizontal lines give further emphasis to the slim format of these masonry units. This technique was also used by Frank Lloyd Wright in his famous Prairie Style designs.

The building sits on a slab on ground and uses conventional veneer construction with timber flooring above. The upper level is clad in rendered polystyrene.

We asked Brian Lowe why he recommended concrete masonry for this project. "It's fashionable at the moment, people like it," he says. The coloured smooth-face blocks "just sit there nicely and don't dominate the facade. They are not meant to be a feature. The split face units are a feature, the cedar is a feature and the amount of glass is a feature. The rest you just want to lose."

Lowe specifies the split face masonry units "quite a bit, both the 90 mm and slim 45 mm. The 90 mm is more of a brick size so it isn't quite as sharp a detail as the 45 mm but it's a little cheaper and it still gives you a good contrast to the rest of the building. But if you want something really smart we use the slim concrete masonry units. It's a really good, sharp finish."

The location within metres of salt water requires special attention to finish and fittings. These Austral Masonry units are classified as Exposure Grade and therefore suitable for use in a saline environment. The wall ties are stainless steel, as are the gutters and numerous other fittings such as brackets, deck nails and external taps. Commercial grade aluminium trims were also specified.

The owners are keen entertainers and very pleased that the design allows them to balance this with the demands of their young family. The peloton may be keen to thunder down Beach Road but this family is content to gaze over Port Phillip Bay from their panoramic vantage point.

# IN PROFILE



The Schiavo house in inner-city Melbourne makes exceptional use of a tiny site. Kennedy Nolan Architects principals Patrick Kennedy and Rachel Nolan are university friends turned business partners.



Architect and urban designer Gerry McLoughlin reviews the work of Kennedy Nolan Architects, a young Melbourne practice that is bringing a fresh approach to small home design.

**Kennedy Nolan Architects is a relatively young practice that has emerged as a firm to watch with a host of notable residential projects to their name. Established 12 years ago out of the rich University of Melbourne field of talent, they bring a freshness to the potential of the small home.**

Patrick Kennedy and Rachel Nolan are university friends turned business partners, which doesn't surprise given they share not only a similar background, country kids from either side of the Wodonga/Albury divide, but also residency at the University of Melbourne's Newman College and their earliest experiences of architecture.

"Some of my earliest memories of innovative design, Patrick and I shared," Nolan recalls. "The 1970s work of the Albury Wodonga Development Corporation, Clyde Cameron College by Kevin Borland and Bernard Brown, and a variety of houses by the project housing company, Merchant Builders, were just some of the projects we would yack about in our early graduate days. I would often visit his house on the way back from work, drink many beers, smoke many cigarettes and chat about architecture."

These influences have shaped this unique firm and their architectural interests around materiality, tactility, porosity, luminosity and the visual; these are the interests of Kennedy Nolan in the making of architecture.

It was a delight to spend time with these warm, earnest architects who are clearly passionate about delivering fine works of architecture no matter how small the site or how modest the program. The architecture is often in the materials on many of these small projects, Rachel tells me.

It may be something to do with the 'north of the Yarra' thing but it is immediately obvious on entering their brick-clad 1940's office in Moor Street, Fitzroy in inner-city Melbourne that has housed this practice for the last nine years, that this delightful pair lead a practice that exudes a relaxed creativity.

This is a firm that is ready on humour and flexibility and is family-friendly with a number of their 11 employees working part-time in order to juggle family, study and other commitments with the business of architecture. Rachel currently works a three day week as she has three small children, however she speaks of the day when she will take the main reins again which will allow Patrick to take time out to do things that he has wanted to do.

This firm has grown and shaped itself around its staff, all architects who have taken time out. Many a baby has slept under the desk, all making it possible to balance family and architecture which is often a deal breaker for many women architects. The firm has allowed for changes which have built a very committed and loyal office that to this day shares a weekly meal.

The workplace is an open plan studio where there is frequent communication across the room on points of detail or reference. There is a sense of flexibility but at the same time a strong sense of commitment to projects and people. Rachel and Patrick are very proud of this and grateful to their staff, although they have to find a new home for the office and so begin the firm's third phase.

Does this wonderful blend of down-to-earthiness, humour and flexibility lend itself to creating beauty in ordinary things?

They admire Mies Van Der Rohe who famously stated that god is in the details. I suspect this firm is as interested in the resolution of detail as they are about the interface between the outside and inside of a project. Landscape and built form are rich veins of interest with the opportunities the intersection of materials provides as well as materiality itself.

In 2004 the firm really kicked off with an award-winning redevelopment of an old factory site in George Street, Fitzroy, a project that Rachel's life partner brought to the fledgling firm, requiring only that it deliver on the program and make some money. It not only met these requirements, but also landed an AIA award and announced that Kennedy Nolan Architects was here to stay.

The firm has developed a reputation as a design-focused practice with a distinctive approach to built form. They work principally on residential projects, but are engaged for a variety of projects ranging from retail to hospitality where a strong design component is required.

Kennedy Nolan Architects is dedicated to the production of architecture that is highly responsive to its context. Much of the work seeks to form a strong relationship with landscape, whether it is a dense urban environment or a rural or coastal area. Their work benefits from a multi-disciplinary approach. Graphics and sculpture inform and are incorporated into the work and the practice is in constant exploration of the possibilities for colour and materials to generate architectural element. They are also interested in low environmental impact which they say is a given for all architectural projects.

This firm has attracted a substantial number of extensions, renovations and new housing projects and was chosen for inclusion in the National Architecture talks held at Lyons Architects last November.

Rachel presented on the potential for the small house, drawing on a number of their projects which demonstrate that a robust program and a tight site are not impediments to a rich plan and the experience of a multitude of living options that can delight, cleverly using materials to achieve interesting architectural spaces.

The small project is particularly relevant as we face ever increasing demand to live within the city's infrastructure footprint in our climate-change-challenged world. Inner city projects are particularly relevant in this discussion.

Schiavo House, a small home in inner-city Melbourne is one such project, designed and constructed early on in their practice. The client was originally a couple that became a single

when they decided to part ways through the project. The site is tiny (8 by 20 metres) and a fine example of their exploration of the play of space and materiality. It also demonstrates that space can be manipulated to deliver a lot of living options.

This is a courtyard house with a suite of rooms that are programmatically flexible to provide for a variety of dwelling options. The project is distinct for the rigour of its planning and for the thematic development of an aesthetic.

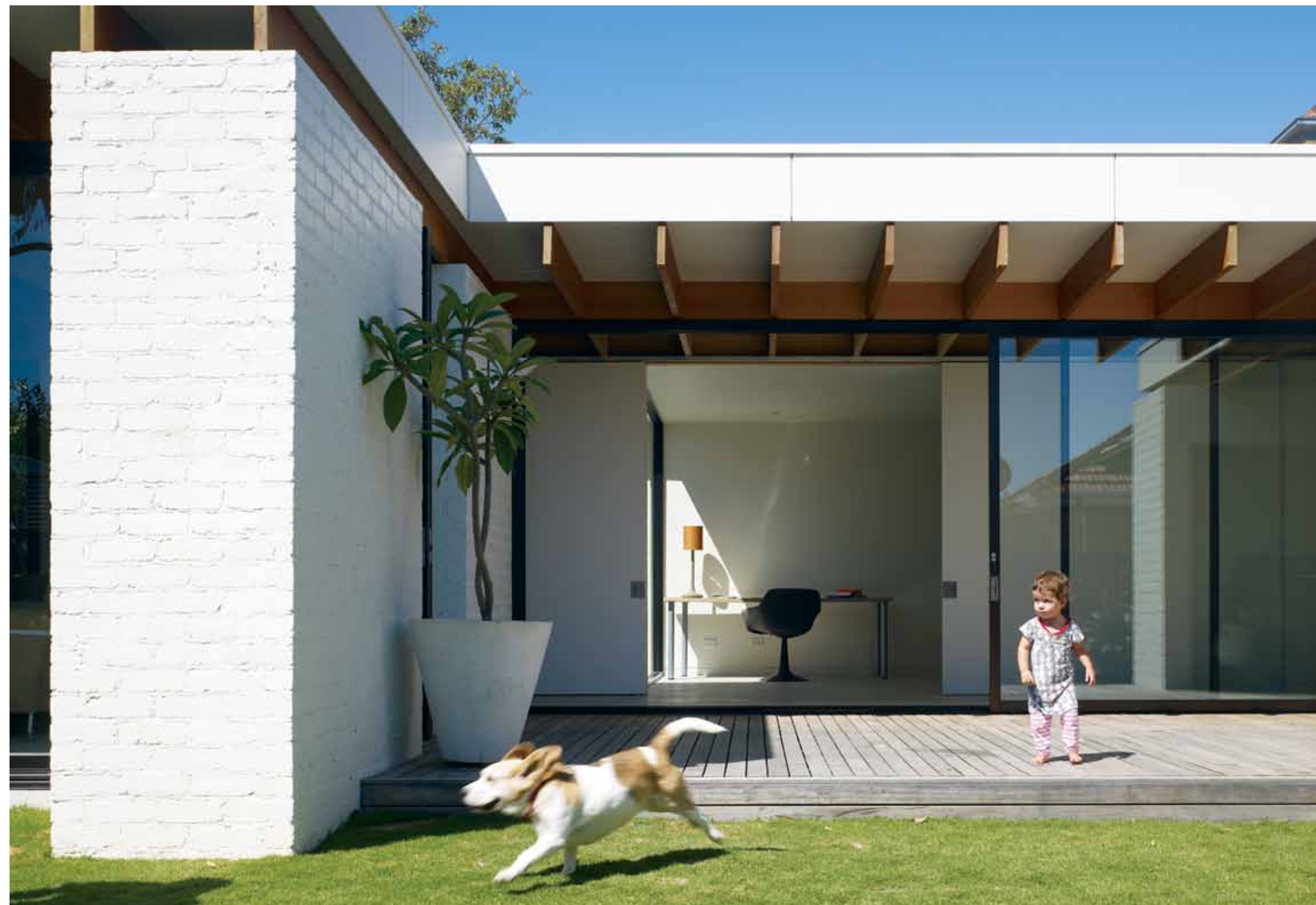
This house is not about space defined by planes, rather it is a collection of volumes. Interior space is devolved into exterior space through large openings, a wall opens as a door, a window acts as a wall, a room becomes a balcony. The interior and exterior volumes of the house are commensurate in proportion, and thus the entire site is the house. Materials, such as the unadorned masonry block wall, and the absence of colour reinforce the architectural concept.

This house integrates programmatic requirements with the development of an aesthetic and the accommodation of various amenities, such that these factors are inseparable. Rachel says she could move her family of five into this tiny house given the flexibility of the spaces and the efficient use of the site.

In 2011, Kennedy Nolan Architects was the subject of an exhibition in the Wunderlich Gallery in the Faculty of Architecture, Building and Planning at the University of Melbourne. Patrick and Rachel displayed a wall-sized mural of black-and-white photographs of their built projects, a free-standing wall that is 'thick' – an aluminium frame covered in fabric – and a lower wall, almost a plinth, whose top is travertine marble. The intentions are similar. Materiality, tactility, porosity, luminosity and visuality: these are the interests of Kennedy Nolan in the making of architecture.

In his review of the exhibition, Philip Goad, Chair of Architecture, University of Melbourne, described their design approach as all about the wall. "What sets Kennedy Nolan apart from other practices in Melbourne is their investigation into the art of the wall. While the work of Mies is a referent, it is only a ghost of one.

"What appears to interest Kennedy Nolan more are the textural walls of the 1960s, when Modernism was undergoing critique from within. One can't see into the exhibition from outside the glazed entry door. You have to go in. Presented with a blank wall, the concerns are not about transparency but about the enclosure of space, the maze and the route. Walls allow the architect/artist to control space.



Photography: Derek Swalwell, Michael Laurie

"... a young Melbourne practice that is bringing a fresh approach to small home design."



"Kennedy Nolan folds Aldo van Eyck's famous experiential ground planes, his circles on the ground - his essentialist thresholds - upwards and around corners. At a school, they become windows for children to look through, even crawl through, or in a house, they become holes in a roof to ponder not the ground but the sky. And a whole wall might be a painting, a number, a mural, or a perforated screen. And a roof might be held up by either a wall or a giant cruciform prop or perhaps a work of art - or are all three the same thing?"

Their interest in materiality, texture and what is known as truthful materials is clear. As Kennedy puts it: "materials that express themselves as they are, there is no need for wall lining on say a brick wall" and "... Brick is a commitment. You can hide a multitude of sins behind a stud wall but you can't do that with a brick wall. A masonry wall achieves the certainty of solidness."

Other projects include Sacred Heart Primary School in Oakleigh and the O'Reilly house, a refurbishment project that features the use of materials in a particularly delightful fashion as well as performing thermally well with an emphasis on white-washed internal

brick dividing walls. The zonings of this house work to achieve the complexity of many people undertaking a range of activities in the space without necessarily imposing on each other.

Lovely Banks House was a very early project. Set on badly degraded farmland outside Geelong, this new house is all about the site context and the plan. It sought to draw from the traditions of the generously-proportioned Australian homestead sitting proudly in the landscape.

The Stockbroker Tudor House project is an interesting project that demonstrates Kennedy Nolan's interest in links with the Arts and Craft movement which predates Modernism. They are interested in the craft of material and the craft of making. This project sought to reconcile High Modernism with Tudor Revival elements of the Arts and Craft movement which would appear to be a very tall order.

Finally, in answer to a question about favourite projects, Rachel says that jealousy is a good measure of how much she's attached to a project. "Coming away from a house and wishing I lived there is a good sign."

**previous page.** Kennedy Nolan Architects works primarily on residential projects, particularly those on small inner-city sites. The practice has a strong interest in materiality, manipulating space and minimising environmental impact.

**this page.** Kennedy Nolan's Eglemont house demonstrates what Phillip Goad, Chair of Architecture at The University of Melbourne called "their investigation into the art of the wall." In contrast, their Stockbroker Tudor House reconciles High Modernism with Tudor Revival elements of Arts and Craft.

# elements of STYLE



Lawyers say that people who represent themselves "have a fool for a client." The same cannot be said for architects for whom designing and building their own home is almost a rite-of-passage.

## Quick Facts

### Parras residence

**Location:**  
Moonee Ponds VIC

**Owners:**  
Damian and Tina Parras

**Architect/project manager:**  
Damian Parras

**Builder:**  
Jag Homes Developments

**Bricklayer:**  
Albi & Son Bricklayers

## Featured Product

Austral Bricks® Elements®  
Zinc semi-glazed clay bricks



Photography: Roger du Buisson



**previous page.** As dusk falls the glaze of the bricks takes on a glow. The brickwork spanning the outdoor room is supported on an L-shaped lintel.

**from left.** The zinc-clad upper level floats above the more grounded brickwork. A glazed internal courtyard draws light into the centre of the house along the narrow northern boundary. Architect Damian Parras describes brickwork as "an honest and very durable material."



**Damian Parras, a partner in Max Architects, and his wife Tina spent five years living on the site in a quiet Moonee Ponds street before commencing construction.**

"First and foremost the house has to work," Damian considers. "That was critical. The aesthetics then plug into that. A house is very much a machine and we spent those five years looking at how we work and operate and live and then related that back to the site and orientation."

The building is constructed on a reinforced slab with a suspended slab at the upper level. The base walling is predominately brick veneer featuring Austral Bricks Elements Zinc semi-glazed bricks. "It was always going to be brick," says Damian. "What I love about brick is that it's an honest and very durable material, especially at ground level. It also works really well in terms of maintenance."

He wanted a dark base to create the foundation of the project and anchor the lighter upper-storey materials. After reviewing products from several brick companies Damian knew his quest had ended as soon as he saw the Elements Zinc. "Its metallic sheen can suddenly spring into life as it

catches the sunlight, adding another layer to the aesthetic quality of the house," he enthuses.

The dark brown mortar was finished with shallow-ironed joints and the walls capped with Colorbond® Ironstone® flashings that drain into concealed gutters.

The west-facing block is a little narrower than standard but Damian and Tina were keen not to build to both boundaries. A bluestone-paved path flanking a silver travertine blade wall leads visitors to a discreet front entrance tucked away in an alcove adjacent to the garage entrance. The balance of the front elevation is taken up with a rumpus room overlooking a small, semi-enclosed garden.

To the rear, an outdoor room with a built-in barbecue connects the dining area, kitchen and main living area with the east-facing backyard via massive sliding glass doors. The nine courses of brickwork spanning the opening are supported on an L-shaped lintel.

The greatest design challenge came on the long northern boundary: how to maximise light penetration without compromising the

view. The solution was to design a glazed internal courtyard that captures the northern sun while maintaining a garden outlook. It also preserves the house's flow-through design, allowing a direct visual connection to the street, even though the main living areas are to the back of the house.

The upper level is clad in zinc to the front and rendered polystyrene to the rear. Damian has recently noticed that the render is starting to weather and wonders whether a light-colour brick – possibly from Austral Bricks Burlesque® series of high-gloss bricks – would have been a better choice.

He is full of praise for their builder – Jag Homes Developments – and the bricklayers, David and John Albi. "The bricklayers were fantastic. They took a lot of pride in their work."

There is an industry joke that an architect's house is never complete. The Parras house is an exception although there is always something to do. Damian and Tina are currently working on the landscaping, but at least their low-maintenance brickwork will stay looking great for generations to come.



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