steelprofile

Architectural steel innovation with BlueScope Steel

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ART DIRECTOR: Natasha Krncevic **CORRESPONDENCE:** Steel Profile, PO Box 981, Crows Nest, NSW 1585 AUSTRALIA.
Email steel.profile@theprojectgroup.com.au

(cover photograph) Jesse Judd's Wheatsheaf residence near Kyneton in Victoria conjures thoughts of cave and wave.

(this page) The Wheatsheaf residence raises many questions. Does it confront the forest, cower before it or retreat within? Slender from one perspective and a black blob from another, there's even a hint of caravan to this holiday home.

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Project The Steel House

Architects Modabode: Paul Lucas & Sarah Bickford

STEEL E-BODE

Robin Boyd's House of Tomorrow challenged contemporary thought about domestic architecture when it went on display in Melbourne 55 years ago. Five years later Harry Seidler's Home of the Future display at Sydney Town Hall caused even more discussion on the way ahead.

Now, as part of Year of the Built Environment activities, six prototype dwellings recently on display in Sydney have challenged existing thought on prefabricated housing.

These six cutting edge structures may not prove to be as important as the Boyd and Seidler designs before them, but Houses of the Future has already attracted crowds you'd more readily expect on an open day at television's "The Block".

At the Sydney Opera House venue the instant neighbourhood quickly set the instant neighbours talking, as the constant stream of visitors provided commentary and verdict without fear or favour. And that was one of the aims of the exhibition.

"Our vision is that the housing industry and its consumers will be encouraged to think differently, to desire better outcomes," said NSW Government Architect and Director of the Year of the Built Environment 2004 NSW Secretariat, Chris Johnson. "From this change in attitude hopefully the housing industry will incorporate new design quality, not just as an aesthetic layer, but also in terms of amenity and environmental performance."

Sarah Bickford and Paul Lucas used their innovative e-Bode

(above) e-Bode's roof generates air currents to promote passive cooling of the module below.

(right) The over-sailing signature roof can be practical parasol, rainwater harvester and solar panel mounting frame.

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prototype on display at the Houses of the Future exhibition to demonstrate the potential of steel when sustainable building design, environmental innovation and design excellence are priorities.

Bickford and Lucas established Modabode on their arrival in Sydney early this year after graduating from UK schools of architecture in the mid-1990s and going on to work for influential architectural practices in London.

Ideas that had hovered at the conceptual stage soon coalesced with the pair's exposure to Australian climate, lifestyle, transportation and building industry realities.

Their vision for the e-Bode is as a modernist, eco-friendly prefabricated steel house, suitable for mass production and ideal as weekender, repeatable resort or mine-site accommodation – or as self-contained housing in an extended family situation.

The concept was and is simple – and has surprisingly survived the inevitable reality check of fabrication and installation, without the need for significant modification. In fact commercially available e-Bode units are just weeks away.

An off-the-shelf e-Bode module measures 3.6m x 14.4m and provides an internal floor area of 50 square metres. There's also a useful wraparound veranda. With those handy dimensions it's just a flatbed truck trip away from solving a wide variety of accommodation requirements. For added versatility an e-Bode configured from two or more modules could create a large family house.

The basic modules are steel framed, which reduces their weight without sacrificing robustness for transportation. All external panels of glazing, solid walls, louvred windows and doors are fitted to the frame in the factory. The interior is then carefully assembled complete with kitchen and bathroom, before the whole module is transferred to a flat-bed truck for delivery.

The cantilevered veranda decks are bolted to the steel framework using prefabricated connecting plates and folded up during transportation.

But surely this has all been done before – after all there's a relocatable building industry catering to education departments, holiday parks and the resources sector? The difference lies with the innovation that Modabode have brought to

their approach. A signature over-sailing roof of COLORBOND® steel atop the module's integral flat roof of the same material is the first of many touches which rule out suspicion of site-shed genes.

The roof addresses many of the criteria established for the Houses of the Future exhibition, where compliance with NSW BASIX requirements was a just a starting point.

Passive solar design, solar power, natural ventilation, recyclable materials and thermal insulation were all drivers of a roof form which is both dynamic and practical.

The roof, designed for prefabrication and separate shipment to site, is bolted to the accommodation module as a practical parasol to reflect radiant heat. At the same time it generates air currents to bolster passive cooling of the building below – aided in this by a narrow floor plan and judicious use of louvred windows for cross ventilation.

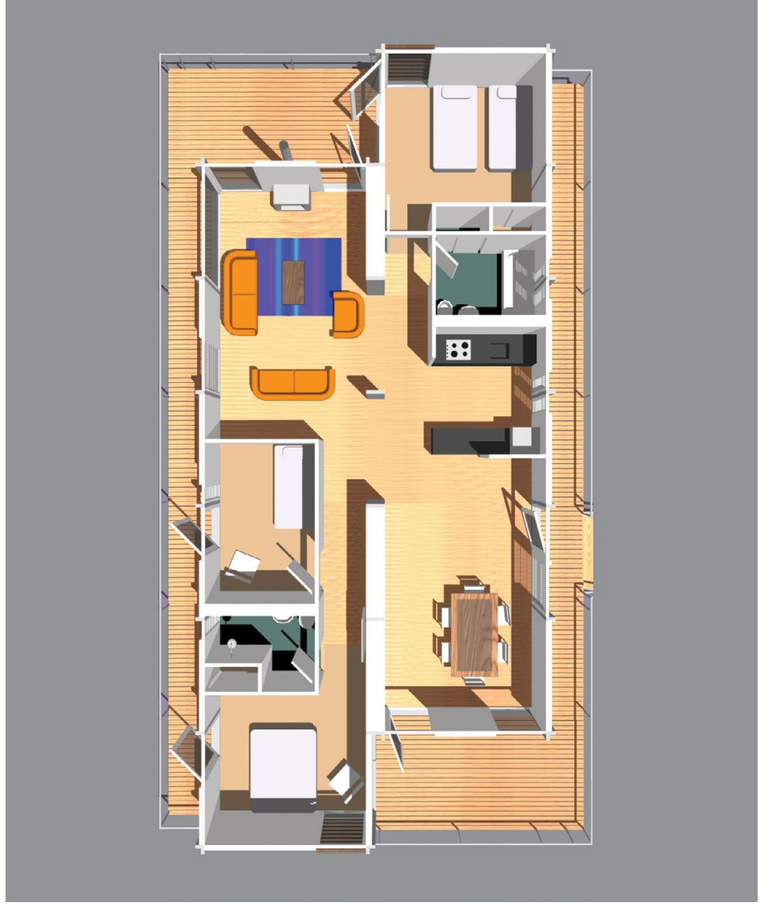
The module is a lightweight structure framed in ZINCALUME® steel with portal frame members fabricated from C-section purlins bolted back to back. Minimum site disturbance is achieved through the use of screw pile footings which also allow use of the steel e-Bode on virtually any terrain.

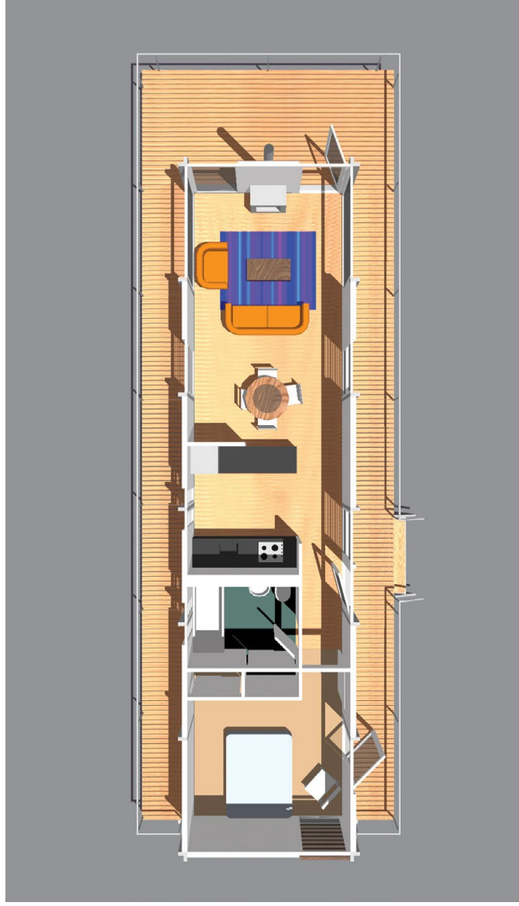
The design provides optimal flexibility for positioning full height fixed and louvre windows, and wall panels which are clad in COLORBOND® steel rollformed in corrugated profile and applied horizontally. Thermally efficient Foilboard wall and ceiling insulation from Solartex retains winter warmth and reflects summer heat.

Although initially displayed in unguttered form, the e-Bode module is designed to put its steep pitched roof to work harvesting rainwater for storage in a tank made from AQUAPLATE® steel. "Water H²OG" plastic tanks can be installed within the floor structure as extra rainwater storage that creates thermal mass as well as providing additional water for toilet flushing or garden use. Roof mounted solar panels take care of hot water requirements.

Flexibility of the module's internal space is enhanced by the almost unlimited options available for positioning the glazing and cladding panels. The e-Bode configured for the Houses of the Future exhibition consisted of bedroom, bathroom, kitchen and living area – a layout suitable for a holiday retreat or as accommodation for an extended family. Vary this layout and you've got a very acceptable home office. Combine two modules and the options expand yet again.

Cladding panels and glazed areas can be arranged to suit individual sites.





(above right) A single module provides room enough for an elegant retreat. Combining two modules (above) opens many more options.

On every front the YBE2004 Houses of the Future exhibition has been greeted with enthusiasm and no shortage of support for the exhibitors. Sarah Bickford and Paul Lucas worked with Stramit's Integrated Steel Solutions business unit, RIPA Steel Fabrications, Tunnel Tech, Multiplex, NBR (Australia) and Macartney Engineering Consultants to turn concepts into reality – and with Multiplex again when the time came to move the steel e-Bode to a new display venue.

The project threw up many challenges, including addressing the unwashed aspects of the underside of the roof. A proactive maintenance program will lead to many years of service from all the steel components incorporated in this unique design. Once faced and resolved, these challenges were soon added to the store of knowledge that takes repeatable housing into the comfort zone of many clients.

Modabode's principals predictably faced the same questions in hundreds of discussions with visitors to the steel house. Many of the queries were about the roof's form and functions and about the flexibility of the module's design. Serious inquiry came from sectors of the commercial and tourist accommodation market such as wineries and boutique resort developers. Equally engaged were couples and families with long held ideas of turning a vacant block "on the coast" or "in the bush" into a stylish, affordable retreat.

In fact "stylish" was a common denominator for many who discussed their ideas with Sarah Bickford and Paul Lucas, especially so for families investigating additional accommodation options at their current home.

Given the aims of the Houses of the Future exhibition – to promote new ways of providing affordable, environmentally sustainable, prefabricated housing in Australia that is also futuristic and innovative – the steel e-Bode seems to answer the challenge in all regards.

Crowds in Sydney have delighted the organisers, but the best is yet to come. Early in 2005 the houses will be moved to Sydney Olympic Park to become part of a major interpretive visitor experience and educational product that will promote the benefits of sustainable building design, environmental innovation and design excellence. Plans are already under way to establish a regular program of school group visits.

With the next generation of home owners exposed to such fresh approaches to the concept of prefabricated, multi-purpose housing, the steel e-Bode makes a significant contribution to the Year of the Built Environment.

Sean Moylan

Project:
e-Abode - The Steel House

Architects:
Modabode -
Paul Lucas & Sarah Bickford

Project Team:
Integrated Steel Solutions
Stephen Harmer, David Hart, Raff Petrone, Vanni Geraldini
RIPA Steel Fabricators
Damien MacKeown
Tunnel Tech
Pat Donlan
Multiplex
Nic DiCondio, Andrew Merriel
NBR (Australia)
Nicholas Roulant
Macartney Engineering Consultants
John Macartney
Cost
$100,00
Photography
Paul Bradshaw

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Project Wheatsheaf Residence

Architect Jesse Judd

Builder Camsom Homes - Wayne Campbell

TURNING POINT

The crossover of architecture from numbers to poetry can seem indivisible. Much like identifying the in-between colours of a rainbow. Sometimes the seams dissolve into a mist of molecules impossible to separate. Ripping architecture inevitably fascinates by virtue of its inter-disciplinary links.

Top shelf projects such as the Wheatsheaf residence near Kyneton, 100 kilometres north-west of Melbourne, create their own songlines. Jesse Judd's black cloaked beauty is a model of bushcraft.

A simple cave and wave-like gesture fashioned from steel and glass creates a vivid private stage in a clearing ringed by fire-scarred Messmate (stringybark) forest. Its coated steel shell visually retreats into the forest's deep space and allows the red stained ply interior to become centre stage ephemeral rather than monumental. This holiday residence investigates the nomadic nature of the lightweight demountable.

Nestled on 10 acres of forest, the extruded form sits at once comfortably within, and distinct from, its monoculture environment. The house examines the notion of the stressed skin structure that seems to be spontaneously relocatable. Its precursors are as diverse as the Airstream trailer, aircraft fuselage and family caravan.

The scheme's two parts function as both discrete and integrated elements, grounded in rudimentary internal planning. Comprising two folded planes, the experience of the house is about the cut section. Front and rear elevations reveal the planar skins, extruded as a simple platonic gesture.

Side elevations divulge little more of the womb-like interior and appear as the simplest temporary vernacular, a corrugated lean-to, complete with veranda. A train carriage aisle connects this space with three linear bedrooms, a severed exposition of the overall platonic volume, expressed through a primary magenta parallel entry.

Contributing editor and photographer Peter Hyatt interviews project architect Jesse Judd about a house with dark connections to Henry Ford.

The point of arrival reveals a stepped floating deck that provides a disciplined edge to the more playful, organic roofline.

(above) Viewed from the rear and south elevation, the house is framed by a row of steel ribs that emphasises the COLORBOND® skin that enfolds and provides the dynamic edge.

This is really architecture as 'wafer' rather than the 'plum pudding', isn't it?

I tried to keep the built form lean because the main structure is just 180mm thick through its widest section. The spirit of the house was for the lean use of materials, products and trades. There was a fascination with that fitness of getting it built quickly and minimising details. Documentation for the whole job was on one A3 page - so yes, it's very slender.

This reductive quality produces a very elemental design.

That's part of the situation of the holiday house that it's not a house where all of your worldly possessions are on display ...it's about simplifying your life and stripping back. It's a place to live well but live simply. Instead of a wall lined with books, this is a place where you bring along only the essentials. You will bring along the one great book you want to read.

The forest gives the house a lot of its power. You create a sense of occasion and stagecraft where there is no obvious audience.

It's an old State logging forest that was seeded with Messmate 30 or 40 years ago and it's this simple mono-cultural aspect that is useful to see as a backdrop for the house.

The rural house has largely been forgotten in the coastal migration. Is the response here only about the Australian bush or have you been informed by other influences?

The bush is the subject. A lot of people have said it's the most urban bush property they have seen, which is intriguing. I like the idea of pitching a tent or dragging a caravan into the bush. I didn't see a fluoro green tent or silver caravan sitting well. Equally, it's not trying to be a farmhouse.

You describe the result as part veranda, part womb-like, yet it also appears a metaphor for a breaking wave. This envelope, or folding action, captures a dynamic, energised form. It would look every bit the part on the coast.

It could sit on the coast. That description of womb-like is that the section returns. Coastal houses tend to be open and outward looking. This is probably inward looking to some extent and the envelope returns in some sections to the minimum height of 2.2m, so it's very enclosing, which is quite opposite to what the ocean view represents. It's quite different here when it's dark. It's pitch black at night so it's a very different experience. There really isn't a moonlight view and you can't capture a view of the tree canopy anyway, because it is so high above the house. The tree trunks are scarified from bushfire so to that end it's really quite an internal response.

Perhaps it taps into the psyche that takes us back to the cave. Perhaps we all have Hobbit as a part of us.

Sitting up off the forest as it does intrigues me too. Once you're down in the valley you have a view over the top of the

property to the treetops but also through and underneath. The builder has done a fantastic job at keeping the underside clear of services. It also allows wildlife to take cover during the rain.

Is it primarily a poetic or numerical response? In other words is it driven by visual and spatial rhythms or is its heart fabrication and engineering?

The fabrication is really the means to the end. There was the desire to treat it like a kit; for it to arrive on site and be erected and clad very simply. Also I hope there is an emotional response of being enclosed within this steel and timber volume. The plywood was intriguing too, alluding to our collective experiences of sitting in a caravan park or perhaps being on a train journey. That procession through to the bedrooms is like a train carriage.

Sustainable design is really being led by architects. What were the environmental issues?

The steelwork is obviously recyclable and demountable, but more fundamentally the timber decking is recycled turpentine from the Woolloomooloo wharves that are old piers hauled out, stripped down and put back into the forest. The rest of the products including the ply is from Australian plantation timbers. Orientation is to the north-west because you get a beautiful filtered light through the trees. Rainwater collection is used for drinking, flushing and irrigation. Apart from being recyclable, the COLORBOND® steel shell is a crucial part of the water collection and storage process.

What are your principal influences?

I'm not sure where I came up with this crazy idea. I was also intrigued by the process of drawing architecture and revealing the actual drawing of the building. Rather than treating the plan as generator, which is where most buildings start from, the cut section is revealed by the section and the experience of that section as you move through the house. Walking around the building you see it in section as very thin and slender. Around the back it is simply this big black blob - so there is this marked difference between volume and surface.

How much complexity is involved for you to achieve this degree of simplicity?

It is an interesting point. What appears the simplest isn't always the simplest construction or way to achieve simplicity. The whole idea of minimalism is something quite different to what is commonly confused to be minimalism. For some it is big white volumes, for others its a reductive process. Just covering everything in plasterboard and painting it white is one view of appearing minimal. Here it had to be simple for the builders and fabricators.

Given the project's voyeuristic quality, how important is the glimpsed view?

The builder has one version of events. When he came back to finish fit-out he wasn't aware that the painters had stained the plywood interior this bright, blood-red. From a distance through the trees at dusk he glimpsed this glaring red object and thought the place was on fire. He put his foot down and drove flat out thinking the place was going up in smoke.

The house is pavilion and refuge. Is that a clue to interesting and successful architecture - the ambiguity of introvert and extrovert?

Yes. People can be a little concerned when they see photos and they ask what would it be like living in a box that is so extroverted. You have to remember there is a five acre forest curtain around you and the bedroom parts of the house are very private. The living room is more the stage.

To what extent do you see architecture as a stage-set? That's a strong part of the project's personality.

There's a disparate use to the house. There are couples and families of different ages and sizes that use the place. There's a few snakes in the forest so the deck is an ideal and safe play area. At night time there is probably an audience of echidnas, wombats and kangaroos.

Apart from budget, what are the three most important questions you ask a client?

I don't want to know how many rooms they need or how big their furniture is. I'd rather know what vision they have for their life. It's a long process of enquiry. I want to know how they will spend their days in the

(left and above) The house admirably satisfies the dual instincts of cave and tree. The vivid interior contrasts the charcoal steel 'veneer' ...dramatic enough for the builder to believe that the house was on fire as he approached along the bush driveway.

BlueScope Steel recommends routine preventative maintenance for eaves and other "unwashed areas" of structures which may not be regularly cleaned by rainfall. For further information please contact your nearest BlueScope steel office or consult www.bluescopesteel.com.au

Project:
Wheatsheaf Residence
Architect:
Jesse Judd
Tel:
0411 214 832
Builder:
Camsom Homes -
Wayne Campbell
Structural engineer:
Perret Simpson
Roofing:
Cressy Plumbing
Steel fabrication:
Shelford Engineering
Principal steel
Cladding:
Walls and roof - COLORBOND® steel rollformed in Lysaght Custom Orb® and Lysaght Longline 305® profiles in the colour Night Sky®
Size:
170 m² (Internal)
135 m² (Decking)
Photography:
Peter Hyatt

(above and opposite)
The stained, ply interiors provide a lightweight lining that reinforce the razor thin steel profile. The house is the result of design as a repeated section rather than the more conventional plan.

house... what will get them out of bed in the morning. It can be difficult to extract from clients. It can take a few meetings and a bottle of wine to get to know them better.

What are your architectural preoccupations?

I'm really more interested in finding the big idea, or couple of big ideas and applying those evenly across a project.

How did the steel skin evolve?

The idea was to have a system where we could erect a frame and skin within a few days and then work internally fitting it out without having to traffic numerous loads of lumber, bricks or concrete. We went with a repeated portal frame and COLORBOND® steel allowed us to skin the house economically. Being so lightweight we could lift the house off the ground with minimal footings and keep a fire resistant underside.

Corrugated steel has a resonant motif in pioneer's huts, sheep and cattle stations. How enduring do you see the new steel architecture?

I don't see any reasons why this should prove any more or less. It has a life span that exceeds many other materials on the market so I don't see why it should be an object of fashion more than any other.

Steel and glass provide the skin, bone and muscle for this house. There can be a criticism that without bulk, or thermal mass, the house must have energy performance issues. How do you deal with winter heat retention and, to a lesser extent, comfort levels in summer?

The maintenance of cool by the appropriate overhangs, orientation and shade is not that difficult. In winter the cool bits are more of an issue. The underside of the floor is heavily insulated but this is a trade-off, or concession. It isn't going to offer the thermal mass of a concrete slab but it is doing something very different in this environment.

What are the possibilities for pre-fabrication of this extruded form being adapted and multiplied for wider housing applications?

There's no reason why this couldn't be mass produced tomorrow. It has two portal frames that are repeated on a regular grid. The windows are identical in each structural bay. There's an exact, even number of plywood sheets in the ceiling and COLORBOND® steel can be pre-fabricated for a precise fit. The whole kit would barely fill a shipping container.

What is the principal appeal of COLORBOND® steel in this location?

I think it was the ability to fold the steel and to use techniques that every roofer understands. It isn't a difficult material to procure, transport or explain. The corrugations give a nice blurred finish that ripples in the bush.

You would get along with Henry Ford. His first production run was restricted to black.

The colour is called 'Night Sky'. It sounds much more interesting than plain 'black'.

Its single biggest achievement?

That you can take a simple four-room house with the dumbest plan possible, intentionally drawn to appear inexpensive to a builder - and then produce something that is intriguing.

What is the project's single most satisfying moment?

The first time I went there after its completion I sat down with the sun pouring into that red room. It just appeared to be on fire at dusk and I thought: 'This works'. That was a glorious moment.

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Project Mater Maria Catholic College, Warriewood, NSW

Architect Fulton Trotter-Carthey / Fulton Trotter & Partners

Builder North Construction and Building Pty Ltd

CLASS ACTION

Warriewood, on Sydney's northern beaches, isn't renowned for contemporary architecture. Dotted with speculative housing estates, it is the view of the Pacific Ocean and undulating bushland that has drawn people to the area. In September 2003 Steel Profile 84 examined Malone Campbell-Allen Pty Ltd's Warriewood Uniting Church. Now, as a result of the area's rapid development and an increasing number of school age students, Warriewood has a new architectural contribution - Mater Maria Catholic College.

Fulton Trotter & Partners, which has offices in Brisbane, Sydney and Tweed Heads, won the commission to design the school following a conference meeting. The firm had recently received an urban design award for a school at Murwillumbah - also in New South Wales - and had shown images of the school at a NSW Catholic School Conference. As a result, the architects were invited, along with four other practices, to present their credentials for the proposed Warriewood school project.

Fulton Trotter & Partners won the commission, and although the firm's Sydney office managed the project, it was architect Mark Trotter, a partner in the practice, and assistant Mark Sciberras, who undertook the schematic design work.

"Our Sydney office team developed the design and documented the project and it was specified by our Tweed team," says Trotter, who is based in Brisbane but travels to Sydney two days each week.

"But, as would be expected by the client (the Broken Bay Diocese Schools Office), the principal and the parents, I was the principal architect for the school at Murwillumbah and that experience was brought to bear on the design concepts for the project," he adds.

Now involved in eight schools in Sydney, Trotter is accustomed to working on projects some distance away from home. His firm has a history of regional work, including hospitals, schools, libraries, galleries and cultural centres in western Queensland.

The idea of simply transposing the Fulton Trotter & Partners design of the award winning school at Murwillumbah was never part of the picture. Partly this was because Fulton Trotter needed to significantly increase the building area (to allow for student growth from 750 students to potentially 900), and to take into account student access to the buildings, both existing and proposed. With a 20 per cent slope and no access to the 10-

Cladding choice and colour selection disrupt any tendency to convey an institutional look.

The school's new chapel, atop a central axis, is expressed using multiple materials.

hectare site by bus, students were dropped at the foot of the hill and made the arduous climb on foot.

Original cream brick 1960s buildings on the site offered little incentive for the climb. The schoolrooms had been almost randomly placed over seven levels on the site and offered almost no view of the ocean, except from small and irregularly placed windows.

More generally, it was clear substantial improvements were needed. The school had no gym, theatre or music rooms. And while there was a chapel, it was meagre and poorly sited. Now a major redevelopment has added five new buildings and changed the school's character.

The undulating Warriewood Valley and the ocean beyond are as much a part of Mater Maria College as the rocky hillside to which it clings and the leafy canopy which envelops it.

"The physical terrain of the site defined the spirit of the place," says Trotter, who organised the master plan around a central axis celebrating the link between the hilltop and ocean. The primary expression of this axis is a grand staircase ascending to the heart of the school, with the chapel at its peak and continuing into the bushland.

"We saw the design as a journey up this staircase that links a series of events providing moments of reflection, discovery and excitement," says Trotter.

Carving out the staircase in the hillside also revealed the site's sandstone core.

"This sandstone foundation was one cue, as was the native flora that inspired the new buildings' materials and form," says Trotter, who likens the new structures to 'sandstone layers' that are 'adorned with leaves and moss in the landscape'.

The gymnasium and theatre occupy the first layer in the composition. Spread across the lowest point of the escarpment, these buildings appear to move, almost dance across their contours, hovering above the ground.

"We looked at aerial photos of the site before we started to discuss possible designs," says Trotter, who retained the existing buildings, with the exception of the old chapel (now sited at the pinnacle of the escarpment). As the footings of the site are relatively precarious and the incline considerable, the architects were reliant on light materials such as steel.

"We use lighter materials such as steel cladding in many of our projects, partly because they're more economical to transport," says Trotter.

The gymnasium and theatre are suspended on concrete columns. But while the base is concrete, the frames of these buildings are in steel. And like leaves and moss that settle on sandstone outcrops, the materials used evoke complex layers in the landscape.

Irregular shaped facades on both the gymnasium and theatre are clad in COLORBOND® Ultra steel rollformed in STRAMIT CORRUGATED® and LONGSPAN® profiles and also copper cladding. The facades are framed by striking blade walls in brown, taupe, silver grey and sandstone coloured compressed fibre cement. These elements combine to create the outer layer of the design frame.

The angular roofs are irregular, both in direction and in the combination of steel profiles used. "We wanted to use both STRAMIT CORRUGATED® and LONGSPAN® profiles," says Trotter. "The idea was

Wall and ceiling cladding in common areas employs COLORBOND® steel in multiple colours and profiles to create interest and texture.

to create a sense of layering, as well as texture." An additional layer - the batten screens outside the windows of the gymnasium - also diffuses the harsher sunlight.

The steel 'verandas' or sunhoods that skirt across the facade further reduce the sun's glare and break up the scale of the buildings. This broken facade alludes to the beach culture of Warriewood. The large selection of colours available in the COLORBOND® Ultra steel palette also gave the architects an opportunity to capture the colours of the bush - from olives and blues to greys and greens.

"I think we used every colour of the COLORBOND® Ultra steel range, bar perhaps one," says Trotter.

"It wasn't just about creating something appropriate for the bush. We didn't want to create an authoritarian style school. We wanted there to be a sense of joy for the children coming here."

Trotter says there has been a significant increase in the school's enrolment since the buildings were completed. Fortunately, the increased numbers don't translate to increase maintenance because, as Trotter points out, "COLORBOND® Ultra steel is low maintenance."

The materials used for the gymnasium and theatre are carried through to the interior spaces. In the gymnasium (also used for assembly) for example, exposed steel beams work their way across the ceiling in conjunction with exposed steel ducts. The walls are clad in a combination of COLORBOND® Ultra steel rollformed in Stramit's CORRUGATED® profile, plywood and plaster.

"We really used steel cladding like paper. It's easy to cut at any angle and lengths aren't a problem," says Trotter, who also appreciates the edge of the steel sheets. "It's quite raw and honest. It's similar to how we approach our architecture," he adds.

The shapes of the windows in the gymnasium reflect the views, broad and elongated at the front of the gymnasium to embrace the horizontality of the ocean ahead, while elongated cin the rear facade, to echo the trunks of the majestic eucalypt trees at the pinnacle of the site. In contrast to the gymnasium, the theatre, seating 143 students, was treated internally as a 'black box', where the view of the stage is most important. But even in this enclosed setting, the use of steel was integral to the design. The ceiling for example, features

(below) The facade of the school appears to hover lightly above the sandstone terrain.

(opposite) Angular roofs break up large areas and deflect strong light from sightlines within the school.

COLORBOND® Ultra steel rollformed in STRAMIT CORRUGATED® profile and perforated for acoustic control.

The second tier of the development includes music rooms and separate studios for students to practise their instruments without disturbing others. Each booth features angled walls, roof and windows. "By angling each surface, you reduce the reverberations. Sound travelling back and forth horizontally can be a problem," says Trotter. And while these separate nodules are at a distance from the music classrooms, the studios are linked with steel verandas that allow students to gather informally.

"I suppose these verandas reflect influence from our Queensland experience

The gymnasium repeats the theme of diversity throught eclectic choice of cladding material and colour.

(below) Ceiling panels of COLORBOND Ultra® steel rollformed in STRAMIT ACOUSTIC CORRUGATED® profile helps optimise theatre sound control.

and our work particularly in rural areas," says Trotter, who was keen to layer the roofs as he had done to the facade. By simply layering the roofs, one protruding over the other, the architects could dispense with complex valley flashings.

"The system appears more delicate. The arrangement adds a much lighter touch to the design," he says. With the area's high rainfall, the angled rooflines (10 degrees) are also effective in channelling stormwater.

The new chapel, located at the pinnacle of the escarpment, is certainly worth the climb (although the arrangement of stairs and ramps make the climb relatively effortless). The chapel, which is constructed using a mixture of COLORBOND® Ultra steel rollformed in STRAMIT CORRUGATED® profile, natural and rendered concrete block, fibre cement and copper, appears as another outcrop in the bush.

But while the exterior form is alluring, it is the views from within that are truly magical, almost spiritual. A glass cruciform window set into the masonry wall of the altar offers unimpeded views of the ocean. Framed by smaller windows not dissimilar to the irregular shaped windows in Le Corbusier's Chapel of Notre Dame-du-Haut at Ronchamp in France, diffused light fills the entire building.

And while the chapel is relatively compact, the architects created amphitheatre-style seating to the rear of the building, with large glazed doors that can be opened for extra ventilation, particularly during the warmer months. While it isn't mandatory for guests to sit on the amphitheatre's concrete steps, it's certainly obligatory to climb to the top to appreciate the site in its entirety.

For Fulton Trotter & Partners, this school and the eight other schools they are working on around Sydney provide an opportunity to create an environment that both excites students and stimulates the practice.

"We workshopped ideas with the students and staff. They wanted outdoor play areas where they didn't feel confined. They also wanted us to create a school that was conscious of its environment," says Trotter. "Schools should be uplifting environments, irrespective of whether or not they have this outlook," he adds.

As Trotter reflects on the project, he is also mindful of the clients who believed in his vision.

"To have a client go with you to the end of a project is extremely rewarding," he says.

"And while the architects were keen to push their own boundaries, so were the builders and everyone else involved in the project. But like any worthwhile endeavour there were also times I felt we were at the edge of our own bravery," Trotter says.

Stephen Crafti

Project:
Mater Maria Catholic College, Warriewood, NSW

Redevelopment Stage 1

Architect:
Fulton Trotter Carthey / Fulton Trotter & Partners

Project Team:
Mark Trotter, Jane Carthey, Roger Carthey, Frank Moss, Robert Wesener, Greg Isaac, Mark Sciberras, Katerina Dracopoulos, Dan Walton, Monica Gonzalez

Builder:
North Construction and Building Pty Ltd

Steel Fabricators:
Southern Cross Rigging & Constructions

Structural Engineers:
Bond James Norrie Marsden

Roofing Contractor:
Jeff Fuller Roofing

Steel Cladding Used:
Roof - COLORBOND® Ultra steel rollformed in STRAMIT CORRUGATED®, LONGSPAN® and STRAMIT SPEED DECK ULTRA® concealed fixed decking profiles
Exterior walls - COLORBOND® Ultra steel rollformed in STRAMIT CORRUGATED® and LONGSPAN®
Ceilings - COLORBOND® Ultra steel rollformed in STRAMIT ACOUSTIC CORRUGATED® profile
Interior walls - COLORBOND® Ultra steel rollformed in STRAMIT ACOUSTIC CORRUGATED® profile.

Construction cost:
$7,900,000

Photography:
Warren Kirby

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Project	Peppermint Bay
Architect	Terroir Pty Ltd
Structural engineer	Jim Gandy (Gandy and Roberts)
Builder	Fairbrother Pty Ltd
Steel Fabricator	Crisp Brothers

WATERFRONT CONNECTION

A new convention centre on Tasmania's southeast coast says Architecture writ large. It achieves all of this with a fast forward construction time frame, slender budget and 'green' gesture. Peppermint Bay is beguiling but not a place to be messed with nevertheless. The last thing the area needed was the grand, multi-storeyed statement. Instead, project architects Terroir deferred to the botanical and natural. Evidence of this is everywhere and nowhere more so than the coated steel roofscape. Terroir demonstrate how subtraction can reveal the essence. By water's edge this project shapes as a...

Exemplary design is always in short supply. Even then the public can be difficult to convince. Architecture still suffers a hangover for its perceived elitism, quirkiness and irrelevance. It's a topic that deserves a convention all of its own. And what better place to begin than in a setting such as Peppermint Bay in a building that marks its territory with such delicate, but sure-footed definition.

Just 40 kilometres south of Hobart, this site and project could have easily been a facsimile of so many ponderous tourism-based developments along Australia's east coast - the type for which architects are held responsible but, in reality, are rarely consulted.

Peppermint Bay is at the core of a multi-faceted tourism development that takes in a journey by high speed multi-purpose cruise vessel from the Hobart waterfront or a 40 minute car ride through the D'Entrecasteaux Channel region - an inlet on the River Derwent, located near the country town of Woodbridge.

Good architecture doesn't need to dominate its place to make

On-site ponds provide kitchen staff with access to a wide variety of sea-life including Atlantic salmon and crayfish. Herb and vegetable gardens were also an integral part of the landscaping response.

A prominent and distinguished roofline finished in COLORBOND® steel echoes the mountain range immediately to the west.

(opposite) Viewed from the principal dining room, this specimen oak tree provides a pivotal design reference.

a lasting impression. In this respect the project resists the urge of the grand gesture. Instead it is partly absorbed into its gently sloping site. And while the undulations and wedges of its steel roof might seem more than is required, it is an organic gesture tied to the adjacent mountain range. Its environmental response is also influenced by even more immediate reference points such as a century old oak tree and waterfront.

Terroir is French for a site's soul. This 'soul' investigates the interplay between natural elements of a site and human intervention. The response of billowing rooms of Victorian era scale, arched windows and roof as sculptural element not dumb mechanical services shed, contributes to an elegant resolution.

Architecture, culture and landscape are interconnected themes that inform Terroir's work across a range of tourism-based projects in Tasmania. Peppermint Bay is the first completed with others underway.

On the edge of the D'Entrecasteaux Channel, the area has been a time capsule for the past few decades.

Neither its fishing village origins or day trip appeal have given a focus other than as charming backwater. Few wanted a megamart or casino dropped into the area, but a convention centre, restaurant, retail store and bar - not a pokie machine in sight - is bound to attract a whole new league of punters.

Based around the picturesque journey to and from the peninsula, by river - a one and a half hour boat trip from Hobart - or road, this journey is integral to the visitor experience. A path from the water's edge connects the esplanade with the ferry that brings visitors to and from Hobart.

The convention centre was conceived as a project that holistically connects landscape and structure rather than as a series of disconnected elements. It comprises building, garden and associated features as built form experience. The defining aspect and key image of the centre is its reconfiguration of the peninsula into a single "garden" destination.

Public spaces beyond the wall are divided into three zones, each of which has a precise and different relationship to the landscape. An intimate locals bar hovers atop the small cliff to provide connection with the water below. The restaurant concentrates the view across the bay to the horizon, while the function area gathers itself opposite the oak tree at the end of the ziggurat route.

A grey metal landscape results from the gathering of all roof and wall elements, exhausts, and entry and exit sequences into a singular plate of steel roof decking. The plate front opens to a yawning aperture between the public spaces and view. It provides an overall form and facade pattern responsive to the rugged mountain backdrop.

The design provides a circulation spine, or passageway, that dog-legs and follows the contour of the gently sloping site. Services, retail and meal preparation areas are on the right, while bar, dining and convention areas are plugged to the left.

An elongated entry space connects car-park through to garden. Glimpses of the kitchen, bar and restaurant spaces beyond are available from the 'pathway' described by a timber container. This harbour's entry points towards public areas (bar, dining, function) qand a series of service areas and stores. Placement of this path between the kitchen and dining spaces also allows visitors to experience food preparation. Kitchen staff are visible with fresh seafood from on-site ponds, garden grown herbs and vegetables.

Integrated in the site are multiple live fish ponds (Atlantic salmon and crayfish or instance). These incorporate continuous pumped and returned sea-water from the D'Entrecasteaux channel.

With a convention capacity of 400 and venue for the region's art and craft makers, the project is a new concept in the burgeoning Tasmanian tourism and hospitality industry. Floor-plan flexibility allows executive board meetings in the function space, adjacent to epicurean dining room patrons - next to locals in the bar. Two operable walls between bar/dining and dining/function provide a high level of acoustic and visual privacy.

The functional layout within the 1,050 square metre internal floor area comprises diverse functions that includes a 100-seat function room, 100-seat dining room, wine cellar, public bar with adjacent outdoor terrace/entertainment area, kitchen, delivery, storage facilities and retail outlet.

A zigzag water course permits children's boat races while a nearby herb wall is utilised daily by the kitchen for its fresh produce. Numerous external gardens have been sculpted from the existing vegetation, to provide identifiable planting 'niches'. In-ground water is used for all of the site's irrigation, and constant replenishment means the water can be used to achieve the required four hour minimum of on-site water for fire supply.

Regional and site specific design, the centre's main feature window/wall uses an idiosyncratic glazing program along the north east facade.

The project was completed in just 20 weeks - 'testament enough', Terroir's Scott Balmforth points out, 'to the selection of materials and capacity of local trades people'. The selection of roofing made from COLORBOND® steel in the colour Woodland Grey® rollformed in LYSAGHT TRIMDEK® profile provided crucial speed and shelter advantages to allow wet and finishing trades to work simultaneously.

Because of its high visibility and exposed location, all roof elements required a high standard of finish and durability. With local trade skills, the roof was fabricated on-site. Rainwater which falls on it is harvested, stored in below-ground tanks and used for toilet flushing.

"We aimed to produce an iconic building with a tight budget. One way of achieving this," says Balmforth, "was to use familiar locally available materials, a steel frame and cladding for instance. This allowed a very high level of resolution and detail finish to those materials. Two examples of this are the steel roof and timber wall cladding. These were both pushed to maximum effect by the expertise and commitment of local contractors who were skilled at interpreting complex forms."

All aspects of the construction system, materials and engineering services were judiciously and deliberately selected to improve cost, life cycle and related issues, moderated against budget considerations. As a highly designed and controlled object, all these decisions involved the architect as a key participant and moderator in the decision making process. A strong collaboration with the contractor and their shared commitment to excellence is also evident.

A primary steel frame structure with infill steel purlins was selected for its cost efficiency and ability to minimise site costs.

Attention was paid to the arrangement of simple, economical materials to provide cost effective yet dramatic expression. Examples include the roof and wall cladding made from COLORBOND® steel in the colour Woodland Grey® rollformed in LYSAGHT TRIMDEK® profile externally and the custom-fabricated slotted MDF ceilings - and 40-metre-long Tasmanian Oak timber tongue and groove board wall linings internally.

Given the tight budget, this speaks highly of the project team's capacity to respond to the innovative form and finishes.

For such a high-use public facility, the venue is a low energy consumer. Heating and cooling to public areas relies primarily on a north-east facing glazed feature 'wall', low level doors and ventilation panels. Minimal slab and floor heating is supplemented with local mechanical ventilation of the public bar.

The site's aspect was advantageous in designing high, glazed north-east facades. To temper solar penetration, the external vertical timber louvres provide relief from early morning summer sun, with their maximum intensity along the upper reaches of the function and dining room facades. Lower angled winter sun penetrates deep into public areas and warmth is captured by a concrete floor that runs five metres back from glazed facades.

"The building is a major new entrant in an increasingly competitive tourism market, and the concept from both client and architect was to reveal and interpret the context and landscape," says Balmforth. "Client needs and architectural philosophies were in complete harmony."

Peppermint Bay's convention centre is the consummate metallic tent. Skilfully tuned to place and client need, the project once again confirms how lightweight structures can become such formidable, heavyweight contenders.

Peter Hyatt

Project:
Peppermint Bay

Architect:
Terroir Pty Ltd

Tel.:
(03) 6234 6372

Project team:
Gerard Reinmuth, Richard Blythe, Scott Balmforth, Sarah Benton, Daniel Lane, Paul Sayers, Rolf Svendsen, April Krause

Landscape Architect:
Terroir Pty Ltd

Structural engineer:
Jim Gandy (Gandy and Roberts)

Builder:
Fairbrother Pty Ltd

Steel Fabricator:
Crisp Brothers

Principal steel cladding:
Roof and wall cladding made from COLORBOND® steel in the colour Woodland Grey® rollformed in LYSAGHT TRIMDEK® profile

Size:
1,050 sq.m.

Project Cost:
$2 million

Photography:
Peter Hyatt

steelprofile

My inspiration

California's Case Study House program of the 1950s was an exceptional event in the history of contemporary residential architecture.
The program oversaw the design of 36 prototype homes that re-defined the residence. Each house was a "case study", solving the individual problems of the client, but in as universal a way as possible. Each client would be understood to represent a different type of homeowner, so instead of fetishising the client's needs, architects participating in the program would try to achieve the broadest possible solution.
The Wheatsheaf House exploits this optimistic agenda, and brings to it a bulbous internal volume enveloped by the thinnest steel skin.

Jesse Judd
Jesse Judd Architects

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