steelprofile

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CLARIFICATION - The following steel products were used on the Nunawading Toyota project (Steel Profile #92):
Roofing – LYSAGHT KLIP-LOK® profile in COLORBOND® steel.
Nose/portico/canopy – LYSAGHT CUSTOM BLUE ORB® profile in COLORBOND® steel.

(cover photograph) Auckland's Botany Downs Secondary School provides a vigorous counterpoint to the neighbourhood context of concrete, brick and tile. Lustrous and sparkling, it takes higher education towards a bright future.

(this page) Troppo's vivid vision for Darwin's suburbs strays creatively from convention. A tree-house of multiple layers, the Mazarotto residence is a tree-house of flitered light and breezes.

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Project Botany Downs Secondary School, Auckland

Architect ASC Architects

Builder Hawkins Constructions

COOL SCHOOL

One of only two new secondary schools built in Auckland in the past 25 years, Botany Downs Secondary College is a torchbearer for intelligent building design. With a big yawn and sleep behind it, the city's secondary education system has been re-energised by articulate simplicity.

Primary and secondary schools are rarely architecture magnets. It's an undersized honour board for schools that have made the quantum leap from trash to treasure. Most end up with bargain-basement looks and performance. Compare this with the rush by universities to use architecture to attract the brightest and best students from around the globe.

Most government secondary schools, starved of funds, live a hand-to-mouth existence, often working with the legacy of temporary and portable structures. However, money is only a part of the equation; tight budgets might be the norm, but they need not necessarily lead to impoverished education. A tight budget can act as smelling salts and help define the moment.

Botany Downs Secondary is a shining example of modest means and materials made most remarkable. Auckland-based ASC architects could have reproduced suburbia in its search for a 'comfortable', non-aspirational fit. Instead, the practice has produced a powerful contrast of luminous steel and glazed structures.

Using a simple, highly appropriate material palette, the school makes a clean break from the neighbourhood vernacular of brick and tile. Evening light rakes into the building.

Stage one of a broader master plan that will see the school double in size by mid-2006. In contrast to most new residential and commercial developments requiring air conditioning to compensate for design flaws, the school is a brilliant student at thermal and solar subjects.

Home to around 700 students, with another 700 awaiting completion of Stage Two next year, the school is proof that education can be much more than Latin catch phrases, smart uniforms and laptop computers. ‘Green’ without being ghastly, intelligent yet cool, it sets a new educational benchmark.

ASC design director John Sofo discusses the emergence of intelligent building design with contributor Peter Hyatt:

There’s a real paradox here. The neighbourhood that provides your students is a sea of brick and tile, and yet the school is utterly opposite. What was your rationale for not complying with the prevailing standards?

We responded with counterpoint. From the community’s perspective it’s a significant public building, so the idea of replicating the domestic standard is a crazy one. It makes no sense to me. I made a very different building for very good reasons. There was an opportunity to give the building a level of lightness and openness you normally can’t achieve with those brick and tile houses. There was nothing there that I thought would contribute to a good school, so there was no reason to replicate what was there.

What did your research reveal?

The fundamental discovery was that there was an enormous separation between family, social and school life, and yet kids have to spend more time than ever at school. So the question was: ‘How can we bring those separate lives together more fully and create a stronger sense of community for kids?’ The notion of the family space, for example, allows parents to visit the school and have lunch with their children.

Were your own experiences as a student instructive?

I went to school in Melbourne, and my memories are of dark, cold classrooms where we sat still, didn’t speak and looked straight ahead. The learning experience needs to more closely resemble what we experience when we leave school. My own memories are of a pretty crummy school. Why not find a way to create an environment that’s uplifting and is positive and aesthetically surprising and fulfilling? I wanted to make sure we could do something that would contribute to an enriched school experience.

Architecture is often overlooked as a way of creating an environment that is crucial to the learning experience and childhood development. How aware were you of these issues when you approached the design here?

I don’t know why a school can’t be an aesthetically lovely place as well. We tried very hard to remove any sense of ‘institution’. I think it’s important to see and experience good environments. A sense of belonging is important whether it’s a school, house or factory.

Visibility and transparency are very evident throughout. Rooms and surfaces are light and minimal rather than slabs of imposing mass. What are the signals you hope this sends to students?

I’m convinced that it makes a huge difference to students’ psyches. The environment you inhabit affects all sort of things, and the more positive the environment, the more positive the effects will be. It doesn’t take a lot of effort to achieve these results, and I was determined to make beautiful buildings wherever I could.

The hardest part was convincing the client about the benefits of design transparency. Teachers were worried that kids wouldn’t concentrate because of distractions. We argued that the schoolroom as the enclosed box is a 19th Century idea. What these structures do is reveal the idea of transparency, openness and sharing of your environment as very powerful and positive. And that has been the experience.

You’ve broken away from formal stereotype classrooms and spaces...

This project was centred around the notion of the ‘Whanau’ – the Maori word for family. It was a pretty risky move away from 30 kids in a rectangular room all learning the same thing at the same time to the notion of them being independent and more responsible. Overlaid is that they belong to this family where all kinds of support mechanisms encourage and promote independent learning. So the school itself really had to reflect some of these major structural changes to learning and teaching.

Interestingly your research appears to have come full circle and returned to New Zealand?

We gathered ideas from around the world for this project.

(above) Air stacks provide additional daylight and fresh air throughout classrooms.

(opposite) Sheltered courtyards and balconies encourage lively meeting places and student circulation.

What we came back with was the notion that we could bring something of culture and family into the New Zealand educational experience. This happened to coincide with overseas research and practice. Finding that, on balance, small schools work better than larger ones, we replicated size by creating small 'Whanaus' where students look after each other and do many of the things you would find in your typical family setting – such as eating and playing together. That was a founding principle upon which the whole school was built.

In a world of growing insecurity, here is a school that appears remarkably open and accessible...

We deliberately wanted it to be visible, to eliminate high walls and have a high level of transparency. Occupants experience big spaces that can be easily inhabited. So 'open, accessible and visible' is really more the school's credo than the idea of a fortress.

Budget is often used as an excuse for not achieving more. You found some answers with your choice of materials.

There were never the funds to explore the building as a grand technological gesture. These things are funded at about the same price per square metre as an average house. Our biggest decision was the ratio of metal cladding to glass because we wanted the buildings to be as light, yet as luminous, as possible. Materials and transparency were crucial on the available budget.

Were there any concerns expressed about featuring steel as a key expression – a signature for the school if you like?

I have to admit there were several reservations about using steel, but once we showed other examples to the Board of Trustees, it came across very quickly. Certainly a major part of the building was bringing the board along with us, and to trust us to do it well. Once we had developed the concept, the board really left us alone to make the building. To the board's credit, having that faith in us helped us to deliver a better school. That's hasn't always been our experience, and I'm sure that's why we did as good a job as we did.

Sustainable design is quickly evolving into the cliché we had to have. How did you avoid the politically correct regulation box?

Formula design is really the last resort. It just wasn't an option here, but I'm aware of the problems with 'packaged' sustainable design. The New Zealand Government asked us to look at a range of sustainable initiatives in the early design

An articulate form wrapped in coated steel and glass makes an uplifting and contemporary statement for secondary education in NZ.

(below right) Lustrous surfaces introduce a delicate luminosity.

The thoughtful design program provides filtered and reflected light in preference to the usual reliance on artificial sources.

benefit in terms of minimal long-term maintenance, but the product is so cost-effective that we were able to achieve many other things that would have been impossible had we used other cladding products.

There is a lustre to the steel and shimmer to the glazing, and it's these subtleties that contribute to the project's overall lightness and sense of optimism.

I agree. Those are some of the important incidental benefits. The cladding's other benefit is that the building changes from season to season, and from one part of the day to another. You don't get that effect from painted or other pre-finished surfaces – but you do with a steel product like this. Each time you visit, it presents as a different environment.

We've used ZINCALUME® steel before and there wasn't any great complexity in the detailing, so it was a straightforward application. It's a material I've used on projects big and small, and I'm amazed by its suitability across building types. Interestingly enough, it really contributes to the school's identity in a way the board probably never envisaged.

How did you treat energy issues?

The buildings breathe easily, and rarely need artificial light. The design incorporates a number of thermal chimneys and central light wells as well as a reasonably narrow, linear form. This helps generate excellent levels of daylight and air movement.

In the age of hyper-technology there is something disarmingly simple and elegant about a school that is, in effect, a series of crafted, energy and user-responsive sheds.

I've always had a lot of confidence in good natural materials, and have rarely painted any of my projects. I've got to admit the school was initially quite hesitant about that approach but, having seen the result, they're very supportive of the aesthetic essence. While steel is a material that has been used in some heavy-handed ways, it can be adapted very beautifully. In a world infatuated by the high-tech, this appears to be a simple, almost low-tech, response.

These are simple buildings. There's nothing overly sophisticated, no great technological gestures. These are inexpensive, simple buildings with slightly pitched roofs. That's about it. From our point of view, there's no pretence. We just focused on the resources we had to make the best possible spaces inside, outside and between buildings.

It's interesting that difficult circumstances, budgets and briefs can lead to some extremely satisfying results.

Here we had to stretch every dollar and detail, yet it's no less because of that. These projects are exciting because they can have such a positive influence on the lives of so many young people for years to come.

Peter Hyatt

Project:
Botany Downs Secondary School, Auckland

Architect:
ASC Architects

Design team:
John Sofo, Damien McKeown, John Strand
Tel: 64 9 3775332

Consulting engineer:
Mitchell Vranjes Engineers

Builder:
Hawkins Construction

Steel fabricator:
George Grant Engineering

Principal steel cladding material:
ZINCALUME® steel in Metdek profile – roofs and wall cladding, and corrugated COLORSTEEL® Maxx™ prepainted steel soffits.

Project cost:
Approx NZ$15 million

Photography:
Peter Hyatt

stages. We sketched a wide range of options that varied from additional wall insulation to co-generation of the site. In the end, it opted for reasonably low-tech initiatives with very short payback periods such as ample natural light, additional insulation in the walls and unpainted steel to cut the effects of using paint. Natural ventilation throughout the school has also proven highly effective.

What were some of the benefits of products such as ZINCALUME® steel here?

Even though we've used steel cladding extensively before, it gave us the opportunity to incorporate a range of other design features that would have been impossible to achieve with other materials. The advantages were that we used a cladding profile (Metdek) that achieved a strong texture and scale on the building. There is the obvious

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Project Viridian Villas

Client Leighton Properties and Ariadne Australia

Architect John Mainwaring, JMA Architects

COASTAL HIDEAWAY

Sunshine Coast architect John Mainwaring has created a series of treetop sanctuaries that cater for shifting family dynamics, while blending in with the geography and landscape. They also capture magnificent views from a steeply sloping site that overlooks Noosa's Hastings Street and Laguna Bay.

Like other coastal communities around Australia, which have morphed over recent decades from low-key villages dotted with fibro fishermen's shacks to mini-metropolises crammed with new apartments, Noosa, on Queensland's Sunshine Coast, could easily become a victim of its own success. Local architect John Mainwaring says he knew Noosa when Hastings Street was just a sandy road. He first came up and established an architectural practice in 1972 with Gabriel Poole.

Mainwaring says his latest residential scheme draws on the "east-coast aesthetic that I've been working on my entire professional life". He says it's all about the use of shade and airflow, and spaces that work together. He adds that the late Swedish architect, Ralph Erskine, is one of his 'gurus', citing the Scandinavian architect's exploration of light, shade and pattern as a major influence on his own work, particularly Viridian Villas.

The project forms Stage II of The Viridian Noosa development, which includes eight private houses completed earlier this year, and a 147-room resort, currently under construction. Mainwaring asserts The Viridian Noosa project demonstrates it is possible to develop sensitive coastal sites in sustainable and sympathetic ways.

"We've proved that it can be done without doing the heavy-handed concrete dyke buildings, which we call 'chests of drawers'," Mainwaring says. "Viridian consists of very lightweight buildings, which use innovative lightweight construction to get the party walls to work in a multiple-dwelling setting. Of course, we used a lot of steel in a variety of ways across the development."

The Viridian Noosa, which occupies a 19ha site nestled into the hillside overlooking Noosa township, replaces a former banana farm. The site's size and location meant that the development's progress through the local council, and then the courts, was hard-fought and lengthy.

Mainwaring has been working on the project almost 10 years. "It was an extremely controversial project because it was one of the last big sites in Noosa Heads to be developed," he says.

Mainwaring's typical approach, in which he uses lightweight construction with structural and decorative steel elements alongside timber, glass and polycarbonate, was deemed the most appropriate response for this site. As well as achieving compliance, Mainwaring wanted to deliberately obscure the buildings in the trees, so he paid careful attention to site, orientation, and biodiversity, to the point where the villas are barely visible from below.

"It was important that we produced a development that was sympathetic, and ran with the contours. That's why we inserted the laneways across the site – which are flora- and fauna-sympathetic and contour-friendly – and why we chose sympathetic colours and hues."

All dwellings blend in with the trees, so from Noosa's buzzing heart you wouldn't know the development existed.

The Viridian Villas comprise 23 two- and three-bedroom townhouses, each with its own large double garage accessed via lanes that curve across the site. The house and garage elements were conceived as separate pavilions, linked by steel-framed access bridges, which enables them to slip up and down the site, depending on their location in the rugged and awkward terrain.

House and garage elements were conceived as separate elements, linked by steel-framed access bridges.

Also in response to the difficult site, the construction method employed lightweight steel, hardwood and LVL elements, with timber cladding internally and externally, and a range of steel elements throughout.

While these all have functional properties, the different COLORBOND® steel treatments on the facades serve to enhance the aesthetic appearance of the buildings.

Internal party walls were designed to minimise noise transfer between the villas and to achieve fire rating compliance.

Mainwaring compares the construction typology of the new villas to some of the early homes in Brisbane's hilly suburbs. "In this case, we used steel stilts, bracing each building with Vierendeel trusses and capitalising on the technology value of steel," he says. Steel was also used for privacy and glare screens, made up of perforated metal set in steel frames, and for the operable shutters. The roof also uses COLORBOND® steel in the form of sandwich panels that provided extensive spans.

Mainwaring realised a collage-like effect with the external cladding, which incorporates chamfer board, plywood and fibre-cement sheeting sections. Overall, it creates what he refers to as a 'geometricised' landscape. "I'm Influenced by a lot of Aboriginal art, particularly the work of Rosella Namok, a Lockhardt River painter from the Gulf of Carpentaria, who 'geometricises' nature," he says.

"Also, it's a little bit like the work of [Piet] Mondrian and those artists who simplified nature through geometries. That's what we've done with the cladding, so the collage works to produce an environmental integration or empathy."

Internally, each dwelling shares an almost identical basic footprint, although the spatial configuration varies according to the number of bedrooms. In the two-bedroom villas, sleeping spaces are confined to the lower floor, with a large kitchen and living space above, while the three-bedroom units have one bedroom on the upper level and a slightly reduced living space. Both plans feel extremely spacious and open, as all the main living and sleeping spaces boast their own external deck or platform space accessed via full-height doors, and protected by shades, shutters and louvres.

"Because of the retractable fenestration, this living space is virtually your deck: that's how it is conceived," Mainwaring says. "These external spaces are what I call edge nooks: they just provide edges to the external/internal spaces.

"For example there is the outdoor sofa area that works as an intimate edge, or there's the outdoor 'dining in the trees' space, or there is the little

(left and below) All villas feel extremely open and spacious. At the core of each home is an open staircase that links living and sleeping areas.

(above) The Viridian Noosa Residences occupy a difficult 19ha site, nestled into the hillside overlooking the township.

(opposite) Mainwaring describes the project as a 'series of surrealist boxes sitting on stilts, wobbling around in the trees'. Light and ethereal, the residences whisper off into the distance.

breakfast nook off the kitchen. And, downstairs, each bedroom has its own nook. I think it is important for buildings to have different spaces for people to go to, so they can have their own little private area, rather than just one big external deck."

At the core of each home is an open staircase that links the living and sleeping levels: it is framed in steel with timber treads, battens and walls, and acts as a passive chimney. Louvred windows at the bottom pick up breezes off the ocean. These are funnelled up through the stairwell before exiting the building through louvres at the top of the core. Downstairs, the two bedrooms, family bathroom and en-suite are arranged around this core, along with a flexible sleeping/study area and laundry, utility and storage spaces that lead onto an enclosed deck between the house and garage pavilions.

The master bedroom shares an en-suite bathroom with the sleeping/study space, so that it can be accessed by a number of people. Meanwhile the second bedroom is large enough to accommodate one queen-size and one single bed, so the room can be used for sleeping or lounging, and by a range of individuals, from three children to a small family. This carefully considered use of space with inbuilt flexibility results from Mainwaring's awareness that family typologies are changing.

He believes the key to all these areas on the coast is multiple habitation. "KPMG Partner and futures expert Bernard Salt provides us with these statistics all the time, saying the nuclear family is now finished, and we are moving into these hybrid family types.

"These villas have been designed for the different family combinations you can have."

Mainwaring says these homes have been purpose-designed with this changing family demography in mind, which has led to their success. However, he says it's taking a long time for the traditional environmental movement and councils to catch on to this shift.

As well as challenges that arose from the project's embrace of a new design ethos, it tested the delivery team during a difficult construction phase. Mainwaring admits "we had a hell of a time" during construction.

For residential architecture, there's a lot of detail. The rainfall didn't help either, and the nature of the site, a colluvium with various-sized boulders, was problematic. Mainwaring was able to use boulders for retaining walls, helping the builder in the process. Access was also a huge issue, and the sequencing was difficult. "Lastly, this project was undertaken at a time when it was difficult to get tradesman and staff, so our load [as architects] was intensive," he says.

However, Mainwaring is proud the hard work was worthwhile, and he now lives in one of the villas. "As well as being an architect, you become a facilitator: we weren't just building a building, we were facilitating a built form and environmental symbiosis," he says.

"We involved many different disciplines on this project: botanists, environmental scientists, soil engineers, hydraulics experts – the whole gamut. We've demonstrated we can produce places for people to live and enjoy the environment in – without wrecking them."

As well as producing buildings that respect their surroundings, the project's developers have spent more than $1m rehabilitating degraded parts of the site, including planting 36,000 trees. Following completion of those works, about half the site was handed over as public parkland, and the development now provides public access that didn't previously exist.

Mainwaring has succeeded in creating a workable solution for this difficult coastal site. It respects the fragile landscape and spectacular environment, while providing comfortable and flexible spaces for people to live or visit.

"This architecture is like a series of little surrealist boxes sitting on stilts, sort of wobbling around in the trees," he says. "They are not earthy buildings, like a Gregory Burgess building, for example. They are light and ethereal, and they whisper off into the distance. We rely on the rich surfaces of the steel materials to achieve that outcome."

Rachael Bernstone

Project:
Viridian Villas

Client:
Leighton Properties & Ariadne

Architect:
JMA Architects Qld Pty Ltd

Design Architect:
John Mainwaring

Project Architects:
Paolo Denti & Garth Hollindale

Builder:
John Holland

Structural Engineer:
McWilliams Consulting Engineers

Steel fabricator:
Precision Welding & Fabrication, Caloundra

Mechanical/Services Engineer:
Basset Consulting Engineers

Cladding material:
COLORBOND® steel in CUSTOM ORB® profile in the colour Woodland Grey®, and corrugated polycarbonate.

Roofing material:
RITEK® Custom Panel roofing system, with the top sheeting being COLORBOND® steel in CUSTOM ORB® profile in the colour of Woodland Grey® and the bottom sheeting being ZINCALUME® steel in CUSTOM ORB® profile.

Approx Cost:
$18 million

Approx Size:
6000sqm, including decks

Photography:
Paul Bradshaw

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Project Dogwood Crossing @ Miles
Client Murilla Shire Council, Queensland
Architect Paul Trotter, Fulton Trotter & Partners

CROSSING LANDSCAPE AND HISTORY

As a building, Dogwood Crossing @ Miles is unique in Queensland and probably, for that matter, the rest of Australia. Its functions include library, art gallery, social history museum and IT resources centre, in a landmark structure that acts as a beacon for both residents and visitors to the town.

According to architect Paul Trotter, the brief called for more than just a new library and art gallery for Miles, a town of 1400 people (shire population of 2800).

"Queensland's Heritage Trails projects were all about tourism, and showcasing western Queensland, and this building was intended to be a very important stop-off point on the Trail," he says. "It was therefore a building that was attempting to do many things."

In that sense, he adds, the brief was "torturous".

"We had so many different stakeholders: we had to deal with the State Government and their funding arrangements, and we also dealt with the local government and their funding arrangements," he says. "We also had to deal with State Libraries Queensland and the Regional Galleries Association of Queensland, along with the local community, which was a stakeholder as well."

Concept

The architect's concept draws heavily on local history and influences. Before the railway line arrived at Miles in the 1870s, the town was known as Dogwood Crossing, after Dogwood Creek that flows through it. The town and its people have been heavily influenced by their relationship to water, with the creek and nearby Condamine River both bringing drought and floods to the region over the years.

The town's identity was also forged by its location on the intersection of two major highways, and the railway line that connects Brisbane to Western Queensland. Trotter aimed to incorporate all of these elements, which he refers to as crossings, as well as alluding to the rolling countryside and natural environment, in his design for the new building.

At the beginning of the project, Trotter summed up all of his ideas in a hand-drawn sketch, which is now exhibited in the building's main hall. The graphic captures the "spirit of the landscape and the built environment", with its abstracted forms representing aboriginal tracks, roads, railway lines, fences, flowing rivers,

dry creeks, rolling hills, acacia blossoms and gum leaves.

Using these elements to create a new structure that would tie in with the existing library, built in the 1960s, was easy, Trotter says. "Fortunately, the existing building was very grid-like, so we were able to respond by looking at those grids, and then overlaying the meandering rivers, creeks and rolling hills."

The local community also had considerable input into the shape of the new building.

It was the steering committee that suggested trees should feature symbolically in the project, although it was Trotter's renderings of local bottle trees that were to take pride of place in the building's main hall.

There are a number of avenues of bottle trees throughout the town, and Trotter says the committee thought these trees would be an interesting theme to explore in the main space of the building.

Another theme that is literally interpreted in the same space is water, with the 'waterwall' that courses through the main entry area forming the backdrop to the social history museum, and the floor in the same space taking on the appearance of a meandering river bed in flood.

Finally, Trotter wanted to pay homage to what he calls "the other weird landmarks" in Miles. "As you drive through the town you see a building on the left that looks like a mosque, with a strange silver dome on top, and there is also the clock tower to the Shire council chambers, which is artistic and quite art deco in a way," he says.

Design

From the street, visitors to Dogwood Crossing @ Miles are likely to be captivated by the building's most spectacular feature: the central Tree Hall. The main entrance opens onto this space, where the curved steel roof is supported by seven steel bottle trees, each at least seven metres tall, which were made from BlueScope Steel's XLERPLATE® steel and painted black.

Inside the main entrance, and crossing the Tree Hall is the Waterwall, which houses the social history museum. The curved, sloping dividing wall incorporates interpretive

(opposite) Seven huge steel trees support the curved steel roof of the building's central space.

(below) Modern steel lines meld seamlessly with the original 1960s building.

The black-painted XLERPLATE® steel bottle trees tower and wave above the floor area treated with different coloured Marmoleum sections to create the representation of a river or creek. Inlaid text reinforce local stories.

displays that tell personal stories from local people collected as part of this building project. The Waterwall and Tree Hall spaces are linked by the floor treatment: different coloured Marmoleum sections were used to create an artistic representation of a river or creek bed, including inlaid text statements, which reinforce the local stories on the walls.

To the left of the Tree Hall, is the new art gallery, which has a box-like form that relates to the existing library and adjacent Murilla Shire chambers buildings. The structure allows the space to achieve the stable environmental conditions necessary to store and display art, while moveable walls and partitions inside provide maximum flexibility. The art gallery also provides a separate venue for weekly community arts meetings at the rear.

To the right of the Tree Hall, the library's borrowing desk doubles as the main reception for the entire building, with counters and desktops that act as display cases for guidebooks, souvenirs and local mementos. The site of the main desk, just inside the main entrance and at the threshold of the library, enables the entire building to be staffed efficiently from one central location.

The existing library shell was opened up to the street with new windows, and then fitted out with contemporary fixtures and furnishings.

Meanwhile, the IT centre is located at the far end of the Tree Hall. Two further computers in the Waterwall space are loaded with a multimedia version of the social history museum display.

Construction

Trotter designed the building to be constructed in stages. He says fabricating the steel trees was the most challenging part of the construction process.

"In the early conceptual thinking, we were exploring alternatives for the trees, including the use of old trees," he says. "But I was going through a phase in my architecture and art where I was playing with two-dimensional overlays, and it became clear very early on that they were going to be steel and nothing else."

Trotter created some sketches of a range of different trees, and worked with the structural engineer to determine how they might work in the design as structural, rather than purely sculptural, elements.

"We simulated the use of steel by using hard cardboard and I-sections, which lent itself to the use of steel plate," he says. "We tested them with models and structural engineer Wayne Clark gave us sizes and limits for structural requirements. By and large, we weren't that limited: we were able to have really thin tops to the trees. They touch the canopy or the roof very lightly."

Trotter nominated a steel fabricator capable of creating these steel trees. "We also took the builder and steel fabricator to look at similar structures in Brisbane, such as the main structure in Queen Street Mall and the steel curved posts that relate to the coffee clubs in Edward Street," he says.

The trees were created by Allied Welding in Toowoomba. The components were laser-cut at Allied Welding's own facility, and most assembly was done on site.

Trotter says the job came together magnificently. "Steel is a fantastic material," he says. "Because the steel trees took some time to get right in the planning stages, the builder had a number of associated delays as a result.

"We make a habit nowadays, when we are doing a steel building, to make sure the shop drawing process happens quickly."

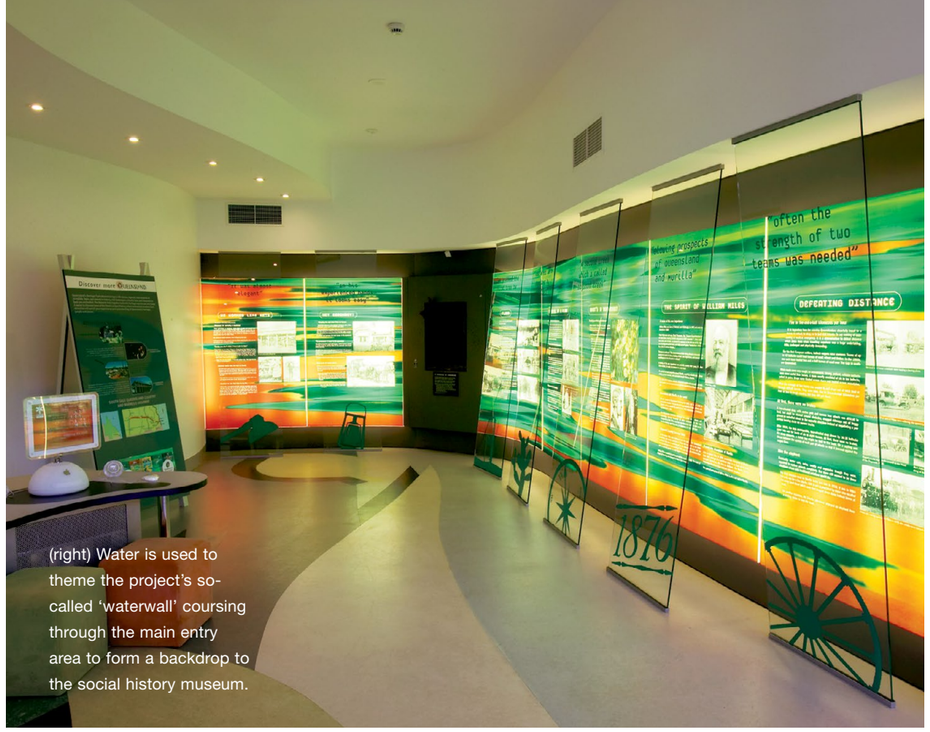
Despite these challenges, Trotter was impressed by how flexible XLERPLATE® steel was as a building material.

"The idea that they can get these slabs of steel, and then laser-cut them, I thought it was incredible," he says.

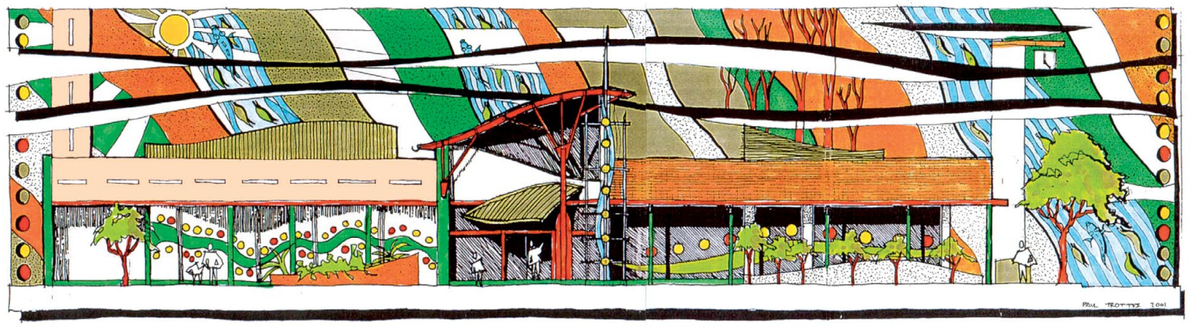
"Steel can be flexible, because there are so many things that you can do with it. It only requires pre-planning to ensure the process runs smoothly."

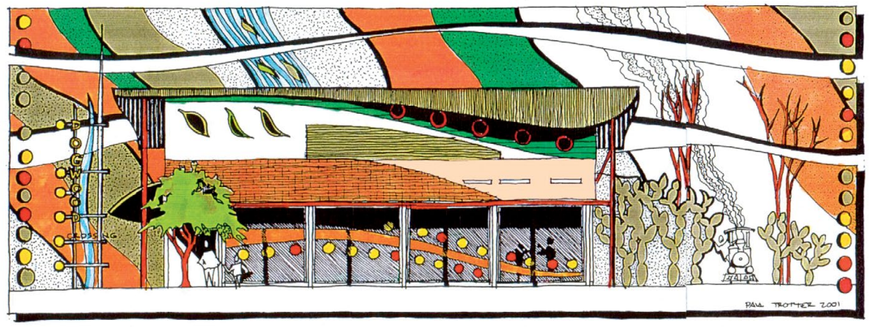
Trotter believes the addition of the steel trees was justified. "Given that the building is a marker as you come into town, it demanded something spectacular," he says.

"We had a lot of fun with the trees, even though we certainly tested a few technologies," he says. "No-one likes pioneering in the industry: when you are a pioneer you have to be very careful. The lesson for us was to make sure we took the time to get the right fabricator involved: we had worked with the building company before and had a good relationship."



(right) Water is used to theme the project's so-called 'waterwall' coursing through the main entry area to form a backdrop to the social history museum.





(centre and opposite) Architect Paul Trotter summed up all initial ideas in sketches designed to capture the 'spirit of the landscape and built environment'. These sketches feature roads, the railway line, rivers, land contours, and local flora and fauna.

Further construction challenges arose from the interface between the exhibition design and the architecture, in terms of what was covered by the building contract and what would be installed by the exhibition designers, Trotter says, calling for well-managed coordination and communication.

Outcome

The success of this architectural project lies in the fact that all the building's disparate functions meld seamlessly within the design. This outcome was achieved as a direct consequence of the integration of ideas and extensive collaboration between the architects and the exhibition designers.

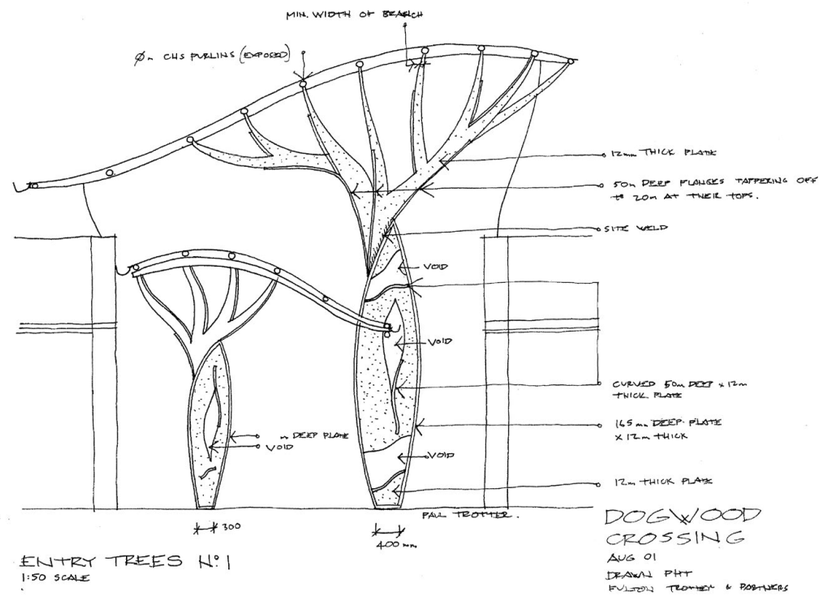
Trotter says the stakeholders and community are thrilled with the final product of that collaboration.

"The community is rapt with the building, and is getting a lot of use out of it – it's not just for tourists," Trotter says. "In fact, the Tree Hall has become a focus for community functions, such as cocktails parties associated with the art gallery, and people are using the space in a range of ways they hadn't expected."

It is obvious from visiting that the XLERPLATE® steel trees have lived up to the lofty expectations Trotter envisaged for them. "The steel trees have become such a dominant element in the community: they have made badges and trophies in the shape of the trees, and the motif is picked up in signage," he says. "I'm happy with that; I find it satisfying and good fun – they are such a powerful symbol."

Trotter credits the successful collaboration among consultants and clients as having an important role in the positive feedback the building is generating from regular visitors and tourists alike.

Rachael Bernstone



Project:
Dogwood Crossing @ Miles
Client:
Murilla Shire Council, Queensland
Architect:
Fulton Trotter & Partners
Design and Project Architect:
Paul Trotter
Project Manager:
Michael James, Brown James Design & Project
Builder:
FK Gardner and Sons
Structural Engineer:
W E Clarke & Associates
Mechanical Consultant:
Ashburner Francis Pty Ltd
Steel fabricator:
Allied Welding and Fabrication
Landscaping:
Landplan Landscape Architects
Principal steel products:
Structural Trees –
XLERPLATE® steel
Wall cladding –
COLORBOND® steel in CUSTOM ORB® profile in the colour of Shale Grey™
Roofing –
COLORBOND® steel in CUSTOM ORB® profile in the colour of Ironstone® on curved sections, and ZINCALUME® steel in LYSAGHT TRIMDEK HI-TEN® profile on flat sections
Approx. cost:
$1 million
Approx size:
550sqm GFA
Photographer:
Paul Bradshaw

024

Project The Matarazzo Residence, Darwin
Architect Troppo Architects
Builder Darwin Construction P/L

DARWIN'S THEORY OF EVOLUTION

Troppo is synonymous with inventive, lightweight architecture in Australia's far north, but continuing success remains problematic in the face of air-conditioned lead design. The Matarazzo House, in the Darwin suburb of Larekeyah, is much more than raking imagery. The house springs from lush tropical foliage and telescopes the wider environment. It's precisely the type of house that has won Troppo world renown.

Clad in a wafer of steel, the house goes all out to provide an environmental connection.

"These clients obviously don't view going without an air conditioner as a deprivation. They see it as a preferable, more comfortable way to live," Troppo co-founder Adrian Welke says.

Breezes, slatted sunlight and pared elements are all a part of Troppo's craft of expressed subtraction. We spoke with Welke about the house and challenges confronting architecture in Australia's tropics.

Have the original meanings of Troppo – a form of musical excess and/or heat-induced tropical madness – provided useful cues for the firm's work? Has there been the defining moment for Troppo?

We had our start in the early '80s when we entered a design competition for the tropics that resulted in three winning finalists and seven commendations – and we were one of the commendations. These 10 projects were built as part of a display village. We had a very strong reaction including several commissions.

Presumably, with success, it's easier to attract clients who are more willing to go along with your ideas rather than question and challenge you every step of the way. There's a clearer expectation of what it is you deliver.

That's the big difference. Now we don't have to work so hard trying to convince people. It's less a matter of conversion to our way than seeing what can be achieved together. That's not just Troppo, of course. There are other good designers working up there in a similar situation.

What is it about the Matarazzo House that captures the Troppo ethos?

Our client is a Darwin-born builder who was brought up in a C-series post-World War II, minimal-stilt house. He understood this type of house could become an example of the kind of work he was really comfortable with.

Post-war houses were stripped-back tropical buildings and were about as good as public housing government architecture got.

(top) West elevation reveals raking roofline, north-facing balcony and awning as discrete element to help deal with high solar loadings.

(bottom) East elevation projects masonry core with lightweight permeability on the first level.

This project provides a quite compelling argument for a more appropriate tropical architecture.

The plan form of this house isn't very different from those old C-series house which had a linear plan form with its bedrooms down one end, bathroom and kitchen tucked off to one side and a living room at the other end.

The only real difference is that it has a larger outdoor living area. Unlike most new Darwin housing – and Australian housing for that matter – it perches on its site and avoids the preoccupation with cut, fill and terrace.

What are the common threads with Troppo's early work?

It's very similar. It redefines the pre-Tracy housing into a new era of materials, structure and lifestyle that were over and above the standard post-Tracy housing.

The Matarazzo house is a fairly conventional building. This particular parcel of land, which is slightly elevated, created comment from some neighbours nervous about the design and potential for intrusive views. The deck was reorientated from the north-west to the north.

There's also an awareness of the importance of openings and apertures working in combination with that rippling, steel skin.

The house has a very loosely defined line between the inside and the outside. It creates a bird-like impression of wings and feathers – especially with the extended north-facing canopy that provides the major living area for the house. That simple gesture catches breezes from the north-east and south-west. When you're on the deck or inside, you experience the place and climate for what it is.

Has steel cladding as lightweight material become one of your signatures?

ZINCALUME® steel cladding traditionally appeals because it provides terrific performance at low cost. What started out as a very utilitarian material has progressed to mean something more than a versatile, flexible skin. It now has an association that has less to do with its cost but a whole aesthetic edge in Australian architecture.

It's interesting that such a lightweight material is used to achieve forms that express how the whole works. You wouldn't get around Darwin in a heavy three-piece suit for example. What you need is light, breathable clothing and, when houses are properly designed, steel cladding represents those light garments.

It's also about extracting the maximum pleasure of living in Darwin. It isn't always about saving energy or saving the world or anything like that. This was a natural consequence and outflow of what we do. Primarily, we were about supporting the hedonistic enjoyment of place and to promote architecture that would help clients enjoy Darwin this way.

Does a fear of cyclones still affect Darwin's psyche?

It's much less of a problem now. In 1980 no-one was ready for what we were offering, but there was a great deal of dissatisfaction with what the Darwin Re-Construction Commission had downloaded on the city. We just joined in the debate.

Was it hard?

It wasn't that difficult. The current situation in Darwin is quite interesting in that much of our earlier work was about promoting the idea and getting housing out there and, to a large extent, those who were engaging us were people with limited funds and certainly no pretension.

So you would argue that the legacy of cyclones has contributed to a more cautious, nervous culture?

The fallout of Cyclone Tracy resulted in an overreaction of building for the worst-case scenario.

The grip has relaxed a little as regulators and the community better understand that buildings could be freer and looser and still meet most, if not all, cyclone building standards.

You have been at the forefront of developing a type of architecture for the tropics, and yet it appears too few people of note have listened?

The energy efficiency measures that have just been introduced in various State and Territory building codes are absolutely nonsensical to the point that many architects are just about regulated out of existence. The type of houses we have designed for the past 25 years no longer meets certain specifications.

Building Code Authority regulations don't recognise that a building can operate without air conditioning or with large areas of properly shaded, or with glazing or louvres for example.

Typically our houses are not air-conditioned. They operate in an entirely different way. We would argue that, in many circumstances, it can be counter-productive to put in insulation or to limit the size of windows. Yet the certification process does not allow any concessions or waivers.

Demonstrating typical Troppo elan, the Matarazzo Residence exhibits a highly considered composition of layers to better deal with the elements.

(below) Kitchen and living area connect directly to outdoor deck. Cooling breezes flow through and around the interior as a celebration of environmental embrace rather than air-conditioned rejection.

The playful notion of the treehouse is achieved using a semi-industrial vocabulary. Small walls, multiple eaves and large openings respond to climatic extremes with low environmental loadings.

As a practice, we should be signing off on these buildings and relieved of the responsibility to insulate which is primarily required to stop heat gain and loss. We use other mechanisms to manage this, so we don't need insulation in the way prescribed and needed for typical new housing.

Most of the development houses have to be fully air-conditioned around the clock because they couldn't survive otherwise. They're energy disaster zones, but they satisfy the regulations.

You're saying, therefore, that houses such as the Matarazzo House are an endangered species?

You can get away with all sorts of rubbish that cuts houses off from their settings in Melbourne, Sydney or Adelaide, but you've got no choice in Darwin. You need to be in there, boots and all, and every aspect of your house has to take maximum advantage of everything this place has going for it.

There is a commonly held view that Troppo has pioneered major change in Australia's Top End. Is that a reasonable view?

I'm sorry to say, we've had very little influence on the majority of Darwin housing. I do come from a perspective that laments where it is going. I don't have a solution, and I don't want to pretend that it's even solvable – but the Darwin we dreamed of in those early post-Tracy days and what is now occurring are two entirely different things.

It's much the loss for Darwin also for the longer term. Maybe I'm a pessimist and I really do lament it. It's a very different marketplace in Darwin now.

Australians have stampeded towards a type of housing that is neither inventive, nor original or especially energy-efficient. What's been lost in the process?

Many Australians imagine they're really Outback types; resourceful individuals who ride horses. The reality is that most people are terrified of the Outback. We have a population in Darwin, and Australia generally, that has moved towards a private, clustered – yet insular and synthetic – existence.

In contrast, our clients are not like that at all and, to that extent, I would say our houses reflect a very different personality from those who treat their house as needing a moat and drawbridge.

There's a theory that says, 'great houses require great clients'. Is it one you subscribe to?

Clients such as the Matarazzos restore your faith that there are people out there who share a deep understanding of how architecture can contribute to a positive change in their lives. They happily and generously demonstrate that spirit.

Troppo has won numerous honours including the Robin Boyd Award. Does a single recognition stand out?

What is really important is that we are about producing buildings for people to live in. It's that process of sitting down with people, and engaging and seeing them delight in their building. That's what makes our architecture hugely satisfying.

Peter Hyatt

Project:
The Matarazzo Residence, Darwin
Architect:
Troppo Architects
Tel: (08) 9336 4533
Structural engineer:
Michael Hatton
Builder:
Darwin Construction P/L
Steel fabricator:
Martello Engineering and Building Express
Principal steel cladding:
ZINCALUME® steel in CUSTOM ORB® profile
Size:
302sqm
Cost:
$320,000
Photography:
Peter Hyatt

steelprofile

My inspiration

"In the early days of the Dogwood Crossing @ Miles project, I did a simple sketch that tried to describe what the building was about… We were trying to capture the spirit of the landscape and the built environment.

As you drive out of Chinchilla towards Miles, the Queensland country starts to roll, and then, criss-crossing over the country, you have grids of road networks, the rail line and so forth, as well as Dogwood Creek and the Condamine River.

Miles is on the crossroads of the Leichhardt and Warrego Highways, and this building sits right on that intersection – thus inspiring the name for the project.

The whole building, then, is about natural and man-made crossings – of roads, railways and waterways – and those elements are incorporated both through the architecture and in the social history museum inside.

The community was also keen to see trees as symbols within the project, and we were captured by bottle trees, which are common on that side of the Great Dividing Range.

We realised they would provide an interesting theme in the main hall of the building, which gave rise to the use of the steel trees in that space."

Paul Trotter
Director
Fulton Trotter & Partners

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