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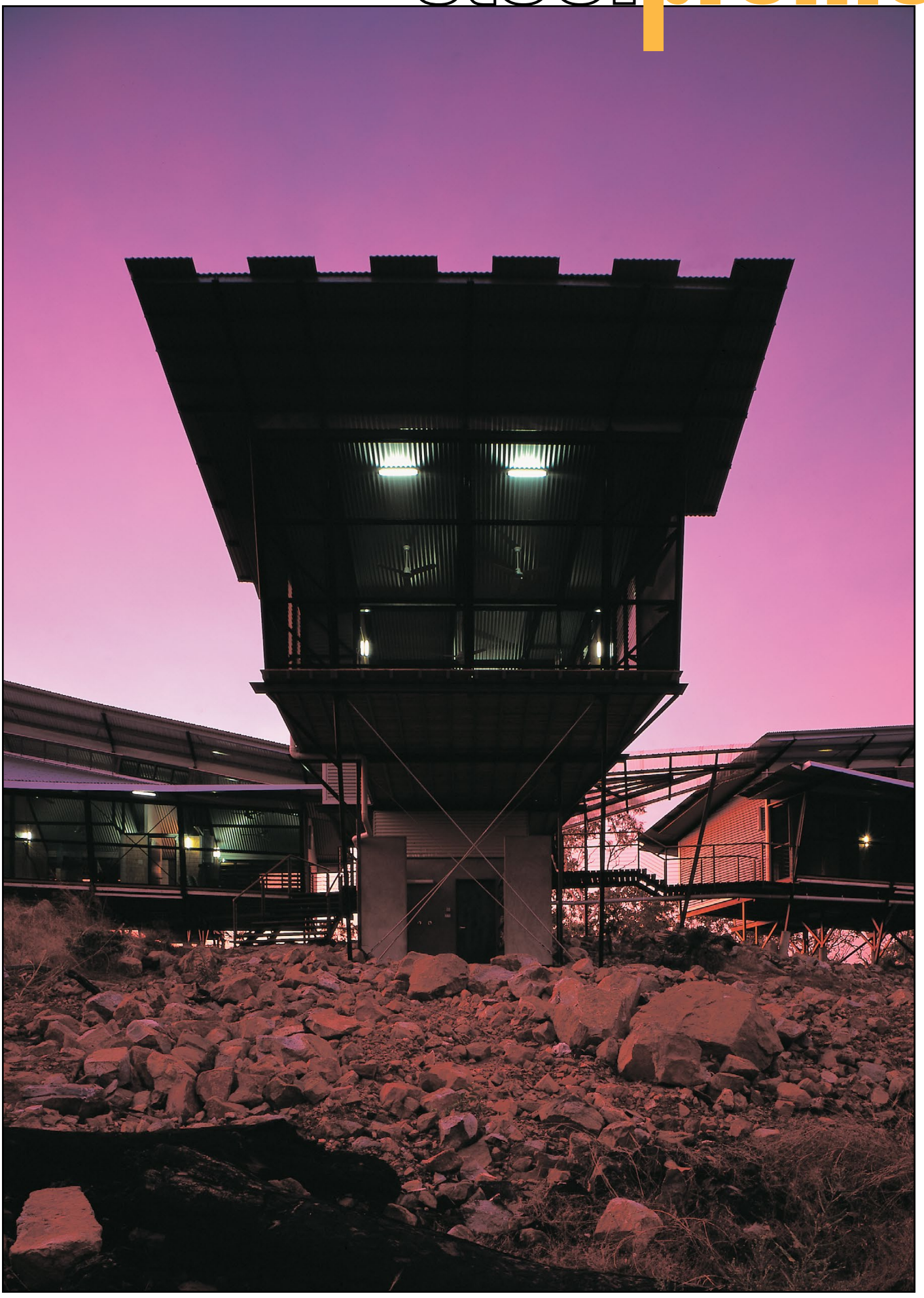


Architectural steel innovation with BHP Steel ***number 78, march 2002***

steelprofile

number 78, march 2002 *published by BHP Steel.*

002
Adrian Welke

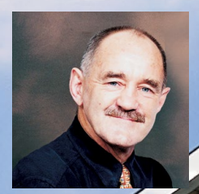
For Darwin's Adrian Welke of Troppo Architects the brief provided by his client was straightforward – find a site, design a house to last 150 years and make sure that it suits its environment TOTALLY. The resulting home 80 kilometres “down the track” from the Northern Territory capital might cause consternation in suburbia, but it's proving ideally suited for the Top End.

010
Marci Webster-Mannison

Charles Sturt University's Marci Webster-Mannison has taken the notion of a university as a place of learning to its obvious conclusion. As CSU Design Director she's been involved in the development of the university's Thurgoona campus from the outset. Its environmental sustainability successes – and lessons – have built a body of knowledge acknowledged by international acclaim.

016
David Millis

DMA Group Architects Brisbane accepted a brief from automotive retailer Motorama. The outcome, contrary to conventional wisdom about such transactions, was that David Millis' firm got much more than it bargained for. Motorama's 4x4xMore facility now gives customers more – including café, gymnasium and obstacle course.



024
Robert Powell

Singapore based architect, planning consultant and author Robert Powell is heading home to England. Before departing South East Asia he visited Bangkok to review a newly completed engine of the new economy. It soon became apparent that when the client's business is packaging, a factory design can rise above the prosaic.

NUMBER 78, MARCH 2002. PRODUCTION: Sean Moylan **PHOTOGRAPHY:** Hyatt & Associatas, Anthony Browell and Warren Kirby **ART DIRECTOR:** Natasha Krncevic **CORRESPONDENCE:** Steel Profile, PO Box 961, Crows Nest, NSW 1585 AUSTRALIA. Email steel.profile@theprojectgroup.com.au

(cover photograph) Like Darth Vader this Top End eminence looks out over ancient worlds. Troppo Architects' design for this Northern Territory house however is a victory for the forces of light in an environment where nature will never play a minor role. Page 2.

(this page) Bold experiment it may have been, but Charles Sturt University's Thurgoona Campus has moved on, evolving but still pushing the boundaries of environmental sustainability. Page 10.

BHPSTEEL

002

Project Rozak House, Lake Bennett, Northern Territory
Architect Troppo Architects P/L
Structural Engineers Colless & O'Neill
Builder Tag Constructions P/L

VERANDAH HOUSE

When Mike Rozak, an émigré American IT specialist, decided to make Australia's Top End his new home he came with some strong ideas about the kind of home he wanted to build. He chose Darwin-based Troppo Architects to help him find a site and fill in the dream. The result is a house made largely from steel, but completely at home with the raw beauty and clinging heat of its location.

Troppo Architects is one of a handful of Australian practices with an international profile. What these practices all have in common is the ability to blend the latest in building technology and materials with an authentic Australian expression. Importantly, that expression is never just a superficial imitation of the pictorial qualities of Aboriginal, colonial or outback building styles, but a genuine response to the realities of Australia's varied climate and topography.

The result is a fascinating dialogue between the modern world and an ancient continent, between the sophistication of a global culture and the simplicity of everyday life in a specific, often rural, locale.

Troppo was established by Adrian Welke and Phil Harris in Darwin in 1981. It has since set up offices in Cairns, Adelaide and Perth. Much of its work has been residential with some medium-sized commercial exceptions such as the Top

(above) Side wings are linked to a central pavilion whose rear entrance is marked by a steel tower which acts as both a viewing platform and lightning rod.

End Hotel and the award-winning Pee Wees at the Point restaurant in Darwin. Welke and Harris spent a lot of time studying traditional architecture in South-East Asia (especially Indonesia) and the vernacular building of the Northern Territory to develop a building typology appropriate for the climate and terrain of the Top End – monsoons and cyclones included.

In recent years the practice has been deeply involved with remote Aboriginal communities designing affordable community facilities which are not just environmentally responsive, but also culturally sensitive.

The Rozak House is a brilliant extension of Troppo strategies adapted to a spectacular, steep site overlooking Lake Bennett, 80 kilometres south of Darwin. It is a bold variation on Troppo's inside-out theme which derived originally from their adaptation of the Balinese compound house where the garden is the living space and the rooms are simply cells within it. In other words, the whole site is the house and the traditional house-as-box is exploded into a cluster of pavilions linked by the garden.

The idea appealed to Mike Rozak who was keen to create privacy and acoustic buffer zones between living spaces – although the house is only 200 square metres, it is 30 metres from end to end. The site is a steep ridge which goes right to the back of the block. The house is placed halfway up where the ridge flattens out and consists of three pavilions which fan out in a generally southerly direction with the rhombus-shaped central pavilion – the living,

dining and kitchen space – projecting dynamically out from the ridge, creating a sense of being suspended in the landscape. The side wings are linked to the central pavilion by a slatted timber walkway and represent respectively a "sunrise" and a "sunset" room. Each is a bedroom with its own bathroom "pod" at the rear,

(above) like insect wings, the steel frame and polycarbonate clad walkway roofs extend to each pavilion

a variation on the "Bali bathroom" with its exposure to the outside, in this case lined with ZINCALUME® zinc/aluminium alloy clad steel, in CUSTOM ORB® profile, perforated for acoustic performance.

Near the rear entry of the central pavilion is a steel tower which is not quite a folly because, apart from offering sensational views of the countryside, it acts as a lightning rod in an area where the entire skyline can often be illuminated by sheet lightning.

The only timber in the house is the slatted cypress pine flooring – even the joists, as well as the bearers and main frame, are galvanized or ZINCALUME® steel. Because all structural elements are steel, there was no need for protection from white ants.

Effectively, the house is a continuous verandah, because the slatted decking extends from the front deep back into the rooms (pods) where the kitchen and bathrooms have slate flooring. It is an idea reinforced by the fact that the front sections of each pavilion are not solid walls but steel mesh – Tuffmesh in the upper sections (more durable and fire-resistant than nylon or standard mesh screen) and Crimsafe, an exceptionally strong stainless steel woven mesh in the lower balustrade zone. This ensures a constant flow of air, not just through the mesh, but also up through the slatted flooring. Likewise, in the wild storms typical of the area, the rain will penetrate but run off through the flooring. Its transparency adds to the sense of being on a floating verandah and part of the surrounding landscape.

Early Troppo houses were almost entirely timber framed using Malaysian hardwoods – like the selangan batu used on the decking to the walkways in this house. But with the cost and complexity of designing cyclone-proof houses, Troppo looked to structural steel frames which also had the added advantage of looking more sleek.

The Rozak House is just within the Darwin Building Control Area and, therefore, had to meet the requirements of cyclonic design. Moreover, the steep escarpment with its fragmented rocky surface required an especially solid structure. In the end, the powerful steel frame seems to disappear from view beneath the floating pavilions, with the columns braced at the foot by what Welke calls "concrete shoes". In this way, the house is strongly braced but without disturbing the landscape which just seems to weave its way through the house.

The elevation of the house and the linear plan form ensure natural ventilation and help get plenty of light into the back areas of the pavilions. Elevating the house makes sure the intense heat radiating from the rocky landscape is kept circulating. Likewise, the distinctive pitching of the skillion pavilion roofs – angled and bending in an exciting sculptural form – is designed to create a convection effect.

"The pitching of the roofs," says Welke, "is principally a means of venting hot air out through the roof space by convection. The whole of the building is uninsulated. There is not much point in

(above and left) Troppo's inside-out theme is aided by lightweight steel construction and an elevation designed to ensure maximum ventilation.

(above) The pitches of the steel roofs are designed to vent hot air by convention.

(top left) Steel columns with concrete “shoes” brace the house with minimal disturbance to the landscape.

(below) ZINCALUME® steel exterior wells and screended enclosures are features of each pavilion

insulating it because you can use the heat transfer through those skins to actually convect air from underneath the roof. It's the air inside the building that you're actually trying to get rid of which gets heated up and moisture-laden. To maintain the ambient temperature outside is the best you can do in Darwin. You can't make it any better than that. You certainly can't take the moisture out of the air unless you go into air conditioning."

Behind the screened verandah spaces, each pavilion is clad on the outside with ZINCALUME® steel in CUSTOM ORB® profile, a "basic and economical material", but also one which met Mike Rozak's concerns about fire and his determination that his house "last for 150 years". The internal ceilings are also ZINCALUME® steel in CUSTOM ORB® profile and because they have the same span as the purlins above they can be fixed immediately on the underside of the roof purlins without secondary battening. It is a simple and inexpensive solution which also happens to optimise the effectiveness of natural ventilation.

At the same time, by repeating the outside textural element on the inside, the sense that there is not much difference between the inside and the outside of the house is reinforced. "You really are on a verandah," says Welke. The lightness, sheen and reflectivity of the ZINCALUME® steel also assists in getting natural light into the house. The interior walls are clad in plywood which is more durable in this humid climate than sheetrock and more easily maintained.

Transparent sheets of corrugated polycarbonate form extensions to the ZINCALUME® steel walls of the rear pods in each pavilion, effectively acting as a transition to the verandah and helping to maximise internal light. Their edges are uncut, a gesture to some old military buildings Welke discovered at Adelaide River which had left the roof eaves staggered to seemingly soften the edges of the sheet. Corrugated polycarbonate is also used to cover the walkways between pavilions.

In the central pavilion, the side walls of the rear pod are interrupted by two columns of glass louvres.

The Rozak House is a celebration of living in a particular landscape – seemingly harsh, but seen by architect and client alike, more as an opportunity than a threat. It is also a celebration of collaboration between architect and client. For Rozak the experience has been so inspiring he has designed a website for other people who want a home designed to meet their own specific needs rather than the uniformities usually on offer: http://www.com.au/EagleEye/default.htm

Paul McGillick

Project
Rozak House, Lake Bennett, Northern Territory

Architect
Troppo Architects P/L

Design Team
Adrian Welke, Joanna Rees

Structural Engineers
Colless & O'Neill

Builder
Tag Constructions P/L

Principal Steel Cladding
Roofing – ZINCALUME® zinc/aluminium alloy clad steel, in CUSTOM ORB® profile
External cladding – ZINCALUME® steel, in CUSTOM ORB® profile
Internal Ceilings – ZINCALUME® steel, in CUSTOM ORB® profile
Bathroom walls – ZINCALUME® steel, in CUSTOM ORB® profile, perforated for acoustic performance.

Size
200 sq. m

Photography
Patrick Bingham-Hall

010

Project: School of Environmental & Information Sciences, Thurgoona Campus Charles Sturt University

Project Architect: Marci Webster-Mannison, Charles Sturt University Office of Design

Design Architects: Marci Webster-Mannison and Chris McInerney, Charles Sturt University Office of Design

Builder: Hilton Saunders/Andrew van Egmond/ Mark Orton, Charles Sturt University

TRULY, WHOLLY, DEEPLY

The new Thurgoona campus of Charles Sturt University, eight kilometres north of Albury-Wodonga, was initially established to house the School of Environmental & Information Sciences, with other schools to follow. The team of in-house designers from CSU, led by Design Director, Marci Webster-Mannison, seized the opportunity this presented, on a largely unserviced rural site, to explore and demonstrate an all-encompassing commitment to environmental sustainability.

What's been created as a result is not just an appropriate campus, but a comprehensive example of current environmental issues, attitudes and design – a unique living (and live-in) case study. Dr David Mitchell, who designed Thurgoona's acclaimed water management system, believes it presents a most pertinent lesson for us all - about 'learning to live in the 21st century'.

Built on 87 hectares of degraded, weed-infested grazing land, the first building at the new campus was completed in 1996. This rammed earth and recycled timber Student Association Building successfully established support for the design direction proposed, and set the agenda for future buildings. Four residential cottages followed. In 1999, came the $3.2 million, 3,000 square metre School of Environmental & Information Sciences, which incorporated a specialist teaching building, research facilities for the Johnstone Centre for Parks, Recreation and Heritage, and a herbarium. The CD Blake Lecture Theatre – a 200 seat theatre and teaching complex - opened in February 2000, followed by more student accommodation. There are now 13 buildings in all and construction continues. Meanwhile, during its short life, the small campus has made a sizeable impression.

The water management system has won two Rivercare awards and an Australian Water & Waste Water Association award. In 2000, the campus received a RAIA (NSW) commendation in the Blacket Award and another for Ecologically Sustainable Design. It also won National Resource Efficiency and Energy Efficiency awards from the MBA and a Metal Building Award. Then, last year, it took out an

To emphasise the deep green ethos, ZINCALUME® rainwater tanks are integrated boldly into the fabric of the buildings.

International Design Resource Award (IDRA) for its use of recycled materials and plantation timber, and Webster-Mannison, the driving force behind the project from the beginning, was presented with a special RAIA 'Jury Award' for her contribution.

As this string of awards might suggest, the principles of sustainability have been applied at Thurgoona more rigorously and more boldly than in any other project of comparable size in Australia. The sheer range of features that have been lined up together is a good measure of this. Many are derived from the accepted strategies; many are unconventional or innovative techniques that were developed on the spot; and "some of the ideas have been unique, like the solar cooled ceilings," says Webster-Mannison. "We looked at the complete spectrum of environmental issues: low energy use, responsible resource management and environmental impact. That included broad scale planning, where we have all water recycled and re-used, right through to detailed decision-making [such as] using non-toxic paints that we had specially mixed for the job."
But the most remarkable aspect of Thurgoona, she says, "has to be the collection of ideas that have all been brought together on this site, and at this scale."

Prior to taking up her position with CSU eight years ago, Webster-Mannison had spent four years researching and using ESD principles in a new building project for the Australian Geological Survey Organisation, and is currently working on a PhD on decision-making strategies involved in environmental design.
Given that Albury-Wodonga is a place of hot dry summers, where temperatures can top 40 degrees and cold wet winters nudge zero, it presented a challenging scenario for the application of her 'deep green ethics'.

"Thurgoona is very much a bio-climatic response to a 'greenfields' site," she says. Water management strategies basically determined the site planning – with water conservation a priority.
Over 40 steel tanks collect rainwater from roofs. Because stormwater is recycled (by solar and wind power), and grey water treated in artificial wetlands and dry composting toilets, no water is wasted.
Existing drainage patterns defined the placement of buildings, roads and services, while a level pedestrian walkway (driving is discouraged) follows the natural contours of the site.

(top left) The foyer of the CD Blake Lecture Theatre, with its circular roof, pitched to optimise solar collection, raised on a playful clerestory ring.

(Bottom left) A continuous 'rainmaker' or spray mist above the air-intake louvres for the Lecture Theatre delivers a new take on evaporative air-cooling.

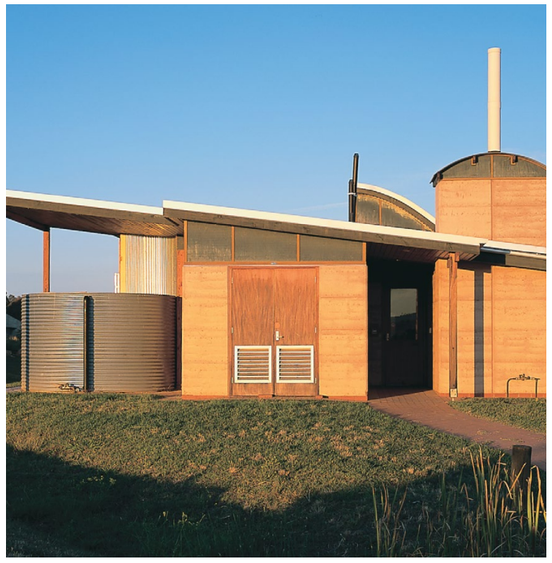
Ovular thermal chimney voids in the School of E&I Sciences - 24mm glass and steel flooring, recycled from the Dixson stacks, increases light penetration to the lower level.

(top left) One of 4 student accommodation buildings, each housing eight students.

(bottom left) The School of Environmental and Information (E&I) Sciences

(top right) Natural forces at work. Wind and solar power are used to recirculate stormwater.

(bottom right) Interconnecting walkways and courtyards, landscaped to reflect the rural and social environments of the region, encourage pedestrian movement through the campus.



Modelling in rammed earth - the western face of E&I Sciences building, with its distinctive thermal chimneys.

The raft of low energy strategies incorporated in the buildings themselves are largely used to stabilise temperatures and control heating and cooling, lighting and air quality. As a short for-instance list, think orientation, footprint, verandahs, thermal mass (rammed earth, concrete, the earth-covered lecture theatre), solar collectors, large shaded openable windows, clerestories, thermal towers, vents and louvres, 'reverse-cycle' hydronic heating and cooling, buoyancy-driven ventilation and evaporative air-cooling systems.

In terms of resource management, renewable, recyclable and natural materials are the preferred options: steel and glass (recycled from the 1930s Dixson stacks from the State Library of NSW), structural rammed earth, recycled and plantation timber, wool carpet and insulation, linoleum and duraloid floors, benchtops, tables and noticeboards, petro-chemical free paints. PVC and plastics have been minimised to avoid toxic off-gassing.

"Part of the challenge I set myself was to make the philosophy highly visible, and that was deliberate because one of the objectives of sustainable design is to change how people think and live, and how we use things," says Webster-Mannison. The 30 or so dry composting toilets that service the site spread the environmental message as clearly as the steel thermal chimneys, the solar panels, the breezeways and the water treatment ponds that have become home to squads of ducks and frogs.

The vernacular language of corrugated steel roofing, verandahs and rainwater tanks could well have been appropriate at Thurgoona for its 'Aussie shed' overtones. But the ZINCALUME® zinc/aluminium alloy coated steel rainwater tanks, which have not only been incorporated into the buildings but instated as prominent features, were designed to add emphasis to the notion of, and the need for, water conservation.

"Steel is a high energy material, but for the expected life-span of the building we've tried to use it appropriately," says Webster-Mannison. "The roofs work with minimal pitches. They probably look a little bit idiosyncratic for that reason, but they basically reflect the desired slope of the solar panels optimised for winter collection."

Picking up the theme of the steel tanks and roofing, a system of blades and awnings was devised to provide shade from winter sun, and prototypes were developed by a local manufacturer. Like much of the construction at Thurgoona, the design was progressed and efficiencies were achieved through productive collaboration with the sub-contractor. The final design allows the ZINCALUME® sheeting to be attached in various ways to a standardised steel frame, according to orientation of the windows.

Charles Sturt University has expanded under a rapid building program since it was established in 1989, and has traditionally handled all its own construction management. Webster-Mannison has seen significant benefits from this practice at Thurgoona. "Working directly with subcontractors on a trade basis, and involving those people in the design development process, has led to a lot of innovations, new ways of detailing or looking at things. People love to work on buildings that are really built rather than staple-gunned together. It's the real craft of building," she says.

(above) The long north/south aspect of the staff offices of the E&I Sciences School maximises natural light penetration and cross-ventilation.

(bottom left) Main entrance to Lecture Theatre Complex, a pivotal point that joins the disparate shapes of the two-storey teaching rooms, left, and earth-covered lecture theatre, right.

(centre and right) ZINCALUME® shade blades, shapes vary according to need and orientation.

Teamwork has been fundamental to the whole project. From the outset, there's been close consultation between the designers and project managers and members of the School of Environmental & Information Sciences staff who were to occupy the buildings, specialist consultants and the University Board.

At the start of each project, particularly, the designers, scientists and engineers would get together to workshop ideas – a process that was critical to the development of many of the most innovative solutions.

Likewise, the greatest achievement of Thurgoona is not to be found in any individual building, but in its absolute dedication to the creation of a healthy, stimulating, low impact environment and the progress that is evident from one building to the next.

"Very rarely, as an architect, do you have the opportunity to build something as large as this campus will be, and to see it right through," says Webster-Mannison. "You're always there, so you're able to learn from your mistakes and go on and develop a new response. Each new building on the campus has grown and developed from the ideas that came before it in a very direct fashion. But the whole process is just as important as the outcome, which is more to do with how we think and the way the people who use the building are going to make decisions in the future."

Jan Howlin

For more about Thurgoona Campus see www.abec.com.au

Project:
School of Environmental & Information Sciences, Thurgoona Campus

Client:
Charles Sturt University

Project Architect
Marci Webster-Mannison, Charles Sturt University Office of Design

Design Architects:
Marci Webster-Mannison and Chris McInerney, Charles Sturt University Office of Design

Architectural Documentation:
SJPH Partnership Design and Chris McInerney/Andrew Mathers, Charles Sturt University Office of Design

Builder:
Hilton Saunders/Andrew van Egmond/Mark Orton, Charles Sturt University

Structural Consultant:
Scott Wilson Irwin Johnson

Civil & Site Services:
Eslers & Associates, Albury

Rammed Earth Contractor:
Ric Linsay, Earth Structures

Hydraulics Consultant:
Gary Tonkin Plumbing/Esler & Associates

Composting Toilets:
Margie Edmunds, Clivus Multrum

Thermal Modelling:
Ché Wall, Advanced Environmental Concepts

Photography:
Anthony Browell

018

Project: Motorama 4X4XMore, Salisbury, Brisbane
Architect: DMA Group Architects, Brisbane
Structural engineer: Saunders and Partners, Brisbane
Builder: Adco Constructions Brisbane

DRIVING AMBITIONS

A gymnasium, cafe, business centre and creche. Oh, and by the way, they sell 4WDs for good measure at Motorama in Brisbane. It's big, big, big and appears to be a forerunner for "car yards" of the future. Hold onto your hat as the possibilities increase for becoming hooked on the convenience and comforts of innovative car retailing.

Automotive showrooms, like the sculptured sheet metal they warehouse, are becoming sharper, sportier and sexier. So much so that many resemble nightclubs, frequent flyer lounges or chic cafes. And why not? Plenty of restaurants, cafes and clubs use auto-eroticism to enhance their appeal.

At 4WD specialist Motorama 4x4xMore, at Salisbury south of Brisbane, the retail purpose of selling adventure is spiced with lifestyle accoutrements that include the facilities to be found at leading resorts.

"The dreaded used car salesman is one of life's greatest fears," says project architect David Millis of DMA Group Architects Brisbane. "The client is well aware of the issues involved. From the outset, the approach was to create an environment which challenged the popular perception of buying and selling cars."

There are for example no sales desks, but customer lounges, a spare parts and accessories market, camping equipment and, a breaking down of that sense where the customer is little more than a target," says Millis.

The design works hard to ensure this is not just a place for petrol, or diesel, heads. A softly, softly approach reflects altered levels of expectation and customer service.

Architecture can be used to create a much more fulfilling experience where the retail imperative is treated as just one part of the dynamics that occur during the courtship between buyer and seller. Boundaries are being blurred with intriguing results. Motorama represents a major retail and cultural realignment where the sale of motor vehicles is treated almost as a by-product. Vehicle-service and travel planning and driving education are all a part of the pitch. An in-house theatrette covers further destinations and driving tips.

More than 200 metres in length, the 14,000 sq. m. facility has a vast roadside

(above) James Corbett's sculptures of animals made from car parts add whimsy to the building's interior.

presence bolstered by symbolic outback gestures that include corrugated steel awnings to provide shade and denote access points. Situated on Beaudesert Rd. Salisbury 10 kms south of Brisbane, the facility is bordered by four lane highway along its main north-east frontage and culvert running parallel at its rear.

Driving by it is difficult to miss the silver topped roof with its internet address splashed across in metre high black lettering.

The stretched, linear plan incorporates a former IPEC transport depot. "We inherited a structure that was in disrepair," says Millis. "The whole thing had to be gutted, site filled and finally incorporated into the new structure. Luckily we could use the basic steel frame, stretch and expand it to generate a form that was appropriate. Recycling the former plant helped reduce some construction costs.

"The result," he enthuses, "is lightweight architecture. Everything is floating and hung. There are gaps and it has an almost temporary feel that is shared by a lot of good Australian architecture," says Millis of the sheet metal on display. "There is certainly a feeling of connecting lightly with the land and the use of materials - steel, is especially vital to that.

"We had an open-minded client. We even felt secure putting forward crazy ideas. It is important for the client relationship not to fear being shot down in flames or ridiculed for ideas. But it was harder to get a budget," muses Millis. "We finally ended up with about $4million that includes building and fitout.

"We conducted plenty of research and couldn't find anything like this. And there is certainly nothing like it in Brisbane. Visitors the world over say they have never seen anything like it. It could be the forerunner," observes Millis. "The days of a glass box or shed from which to sell quality vehicles are over.

"Informality is the key. The essential plan evolved from Aboriginal artwork. We really reworked a painting by Laurie Nilson who grew up near Roma in Queensland. His serpent-like painting of the Bungil Creek bed with its water holes was an inspiring and instigating force in the design. We took that flowing form and the water holes as a reference for theway customer lounges could become a small oasis to relax."

Externally the centre uses water and landscape to soften edges. Large doorways, useful for the inevitable shuffling of vehicles on test drives also create interesting transition zones.

Adding to the sense of "relevant" whimsy are a collection of sculptures that include pelicans, kangaroos and crocodiles - made by sculptor James Corbett entirely from car parts.

Circulation throughout is one of the project's strengths. Administration is centralised near reception with showroom and market immediately beyond.

Left to the southern end are customer lounges, theatrette, creche and cafe and to the north, service bays, business centre and gymnasium.

"The goal, is of course, to sell 4WDs, but our job as architects was to provide a credible link between design and retail environment. People are buying the idea of escape. Many will never go off-road, but in the back of their minds they know they can if they want to.

"This was a driving force for the whole design – what do you do when you escape? You take a journey, you go off road to some of the wonderful parts of Australia. The journey path that runs right through the building. The journey path you take when travelling through the outback, the rainforests and along the coast."

Motorama uses architecture as a way of mapping activities that include an on-site four wheel drive test track and showroom that is undersold by the description 'comprehensive'.

Anyone uncertain about how to fill in the their time between appointments or while their vehicle is being serviced can consider the following - new and used vehicle display areas, service and spare parts centre, 4WD accessories display and sales, apparel outlet, theatrette,

(above and left) In keeping with the 4WD theme a journey path runs through the premises, linking oasis-like customer lounges, a café, gymnasium and even a theatrette.

bistro, childrens play areas, customer lounge and business centre, meeting room, gymnasium, 4WD test track with hills, rocks, sand and water obstacles.

Being some distance from the CBD, it makes plenty of commercial sense to keep customers satisfied while they are waiting for vehicles to be serviced.

"It is unashamedly Australian architecture that shows through in the use of iron and steel. The curves and wave ceiling reinforce the serpentine nature of journeys. Aboriginal art consistently expresses fluid, curvelinear forms and those patterns were used in the planning of this project," says Millis who has succeeded in ironing out many of the usual rectangular elements.

"There are three notional types of Australian countryside - the outback, rainforest and coast. We have tried to incorporate elements of each area intothe interior including the flooring and wildlife sculptures," says Millis. "The curved CUSTOM ORB® ceiling is part sky, part water and provides a soft, reflective canopy.

"CUSTOM ORB® with a ZINCALUME® zinc/aluminium alloy coated steel finish is a part of the Australian vernacular. It isn't fancy. It's rugged, utilitarian and tough. The existing structure had some quite ugly exposed truss elements. We were able to use CUSTOM ORB® to create a contemporary, inexpensive shell."

Being open to a warm north-east aspect, the building is subject to treacherous solar loadings. After considerable investigation, it was felt air conditioning was the only way to deal with the high humidity for which Brisbane is renowned. With multiple access points and transition zones into and throughout the building, the result is a comfortable blend of treated and untreated air.

The main air conditioning duct on the roof is protected by a steel wing structure in CUSTOM ORB® to provide sun protection, thereby lessening power requirements to the system.

"We needed to provide strong visual access to the whole yard and we added a 'glass bubble' with a cafe on the south end," David Mills says.

The Motorama combination offers a startling glimpse into one possibility for the future of automotive retailing and service. "Don't believe that everything is going to take place over the internet," says David Millis. "People will always want human contact and architecture offers a rewarding alternative to selling and servicing in cyber space."

Peter Hyatt

(below) A café and large water feature are just two of the many elements employed to break away from traditional automotive retailing.

ARCHITECT'S STATEMENT

The design has evolved from close cooperation with the client from the outset. Rarely, these days, does an architect have the chance to work with such an enlightened client in an environment which really encourages creativity and lateral thinking.

The design involvement for DMA has included (in addition to architectural design) interior design, furniture selections and working in conjunction with artists and sculptors to complete the total environment for this unique project.

The concept evolved from the client's determination to provide much more than just a vehicle sales environment. The facility caters for the total 4WD experience and "Edutainment" - something which we believe is demanded by an increasingly sophisticated market place - has been addressed throughout the development.

The rectilinear form of the existing building was softened by using curved elements such as corrugated iron ceiling panels, curved pathways and landscaping, free-form joinery pieces, and the curved form of the new extensions.

We created an Australian theme by using corrugated sheet steel, recycled timbers, soft rendered wall surfaces, pebble floor features and strong, earthy colours in a contemporary manner.

The extensive landscaping, with its use of native plants (including bottle trees), recycled timber structures and coloured paved surfaces creates an appropriate setting for the centre.

Artworks by noted aboriginal artists from the Fireworks Gallery reinforce the concept as do James Corbett's whimsical car part sculptures of Australian animals.

We believe the project is unique and represents a bold step forward in the marketing of motor vehicles in this country.

Project:
Motorama 4X4XMore, Salisbury, Brisbane

Client:
Motorama Group

Architect:
DMA Group Architects, Brisbane

Tel:
(07) 3367 8601

Structural Engineer:
Saunders and Partners, Brisbane

Builder:
Adco Constructions, Brisbane

Steel Fabricator:
WTM Group,Brisbane
Principal steel components
Structural beams and purlins, CUSTOM ORB® cladding
CUSTOM BLUE ORB® ceilings, Trimdek Hi Ten roofing

Cost:
$4 million

Photography:
Peter Hyatt

024

Project: TPN FlexPak factory, Bangkok, Thailand

Architect: Suthisak Lerttriluck

Structural engineer: MAA Consultants Co Ltd, Bangkok, Thailand

Builder: KVN Construction Co. Ltd, Bangkok, Thailand

WELL HATCHED

TPN FlexPak is the latest packaging company of Thailand's booming Thung Hua Sinn Printing Group. Its recently opened factory near Bangkok houses state-of-the-art equipment for the production of flexible packaging. To mark the official opening of the plant TPN FlexPak published a brochure that began by stating, "Packaging defines the product. It's the interface between your business and your customers. The art of packaging is the art of presenting the products of your business in the most attractive and practical way."

Those remarks were obviously taken to heart by MAA Consultants. The evidence is a new-economy beacon standing prominently on what not long ago was the site of a traditional freshwater shrimp farm.

The conceptual idea that generated the extraordinary shape of the new TPN FlexPak production facility at Bang Pagong, 36 kilometres from Bangkok in Thailand was, surprisingly, of an "egg". To architect Suthisak Lerttriluck of MAA Consultants this 'shell-like' form symbolised rebirth, rebuilding and 'a new beginning in a new locality'. It also represented continuity, both aspects that the client - the Thung Hua Sinn Printing Group - wished to emphasise.

The notion of stability and respect for the company's founder was another important aspect of the client's brief. It led architect Suthisak to a colour scheme reminiscent of the the terracotta coloured walls of historic Chinese cities. This was intended to acknowledge the Teochew origins of the founder of the company. Both conceptual ideas are brought together convincingly using BHP COLORBOND® prepainted steel and ZINCALUME® zinc/ aluminium alloy coated

(above and below) Seven brick piers on either side of the curved entrance are colour matched to COLORBOND® steel in Terracotta in a reference to the walls of traditional Chinese cities.

(below) The curved ends of the steel roof form conceal machining and ducting.

steel. Furthermore, to this reviewer, the configuration of the completed building conveys the notion of 'flexible packaging' which seems entirely appropriate for the product that is being manufactured.

This was the very first project on which Architect Suthisak, a young graduate of Khon Kaen University School of Architecture in the northeast of Thailand, had been given the lead role by MAA Consultants Co, Ltd., and he was keen to make a strong architectural statement. Yet, he is quick to emphasise that every part of the structure and the seemingly flamboyant shape of the building is the result of a rigorous evaluation of the function. Thus the curved ends of the roof structure conceal machinery and ducting and an overlap in the roof form allows for the ingress of light and fresh air for the air conditioning system. Similarly a large oval element on the rear elevation of the factory is not an aesthetic whim but conceals an exhaust air louvre. Roof drainage gutters were concealed from view by carefully working out sight-lines.

Designing an industrial building is not usually perceived as the most exciting of architectural commissions. The client in many cases is not concerned with aesthetics - the usual criteria are for strictly functional spaces at very minimal capital outlay.One rarely encounters a client in this sector who thinks principally in terms of the public image of the company or one who is prepared to spend money to achieve a delightful and conducive workplace in the interest of productivity. In this respect the Thung Hua Sinn company seem particularly enlightened and the exuberant quality expressed in the external form is carried into the interior where again the notion of an 'egg' is dramatically explored in the shape, the textures and the colour of the entrance lobby and reception counter.

The factory is basically a standard industrial typology i.e. two-storey offices at the front (with an almost mandatory arrival portico designed to impress the visitor); which are connected to and overlook double-height production spaces; with the storage and dispatch facilities located at the rear of the factory, usually with a covered vehicle loading bay. It is a type that one can see anywhere in the world in hundreds of modern industrial estates. To make it different and indeed unique is quite an achievement and the architects are to be congratulated.

Steel profiles have contributed in no small measure to the success of the design. Architect Suthisak was looking for a material for the roof and upper facade, which could be formed into a relatively tight curve in an elegant manner. W750 profile in Armour Grey COLORBOND® steel and ZINCALUME® steel sheet fitted the requirement perfectly when put through the rollformers at Siam Colour Sheet Co. Ltd. and exactly matched his conceptual idea of an 'egg shell'. The product is also suited to the wide span roof, with minimum internal structural supports that the client demanded in order to have flexibility in the arrangement of machinery. The interior of the production spaces is agreeably spacious and brightly illuminated with a combination of artificial and natural light. The working environment is clean and quiet, providing ideal conditions for the manufacture of the high quality packaging product that is the hallmark of TPN FlexPak. The taller storage and dispatch area is already earmarked for future expansion incorporating larger machinery.

Likewise, the W750 profile COLORBOND® steel in the Homestead (Terracotta red) colour, used in uncurved form

for the walls of the factory and storage area, perfectly fits the notion of a stable 'base' for the building, especially when erected with a slight incline. Brick tiles are used for the office facade and these exactly match the colour of the COLORBOND® prepainted steel sheet.

The front façade of the factory is formal in appearance, designed around a central axis:

(above) Turning necessity into a virtue this large oval element featured on the rear elevation houses exhaust air louvres to deal with Thailand's Tropical heat.

(above) The wide span roof prvides the maximum usable internal space.

(below) Inclined walls support the “egg” element central to the facility's design.

(above) The reception area links to a two-storey office area with views over the production facilities.

seven two-storey high, vertical brick piers are arranged on either side of the curved entrance and a steel roofed portico extends forward supported on two slim circular hollow section steel columns. The company logo, a Chinese hieroglyphic, is prominently positioned above the central entrance doors. The arrangement is classical in its symmetry and the brick piers simulate stripped-down columns without capitals.

By contrast the rear elevation is strictly utilitarian, with the works canteen, electrical switchgear and transformers grouped like computer peripherals outside the 'main frame'. It gives the 'back' of the factory a more playful, albeit slightly less organised appearance. Ironically, some of the visually most interesting details using steel products can be found here.

The newly completed TPN FlexPak Industrial building sets a standard for other factories yet to be built on the Wellgrow industrial Estate, located 36 kilometres south west of Bangkok in close proximity to the elevated highway to Pattaya. The notion of the 'new economy' replacing the 'old economy' as Thailand seeks to rapidly expand its industrial capacity is vividly illustrated in the juxtaposition of the TPN FlexPak factory alongside former freshwater shrimp farms which dominated the rural landscape prior to the planning and construction of the infrastructure of the industrial estate. The final result is a production and office facility that rivals the best in Southeast Asia.

Robert Powell

Photography by
Warren Kirby

MY INSPIRATION...

I was brought up to be very conscious of environmental and other political issues, which has had a strong impact on the kind of factors I consider important in the design process. I see buildings in their broader environmental and social context and feel they can contribute to a more just and responsible world.

At Thurgoona, I've been fortunate in that I've been able to pursue the very heartfelt green ethics that's the basis for a lot of my design work. It's been a dream job in two senses: having the opportunity to start with a greenfields site, and being able to have ongoing involvement with the maintenance and use of the campus.

I think you've got to take a broader look at environmental factors than just how they impact on humans. It's a commitment to the future. The emergent design may require persuasion and persistent explanation,

but it comes down to taking responsibility - saying this is the right way to do it - and making that known.

- Marci Webster-Mannison

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