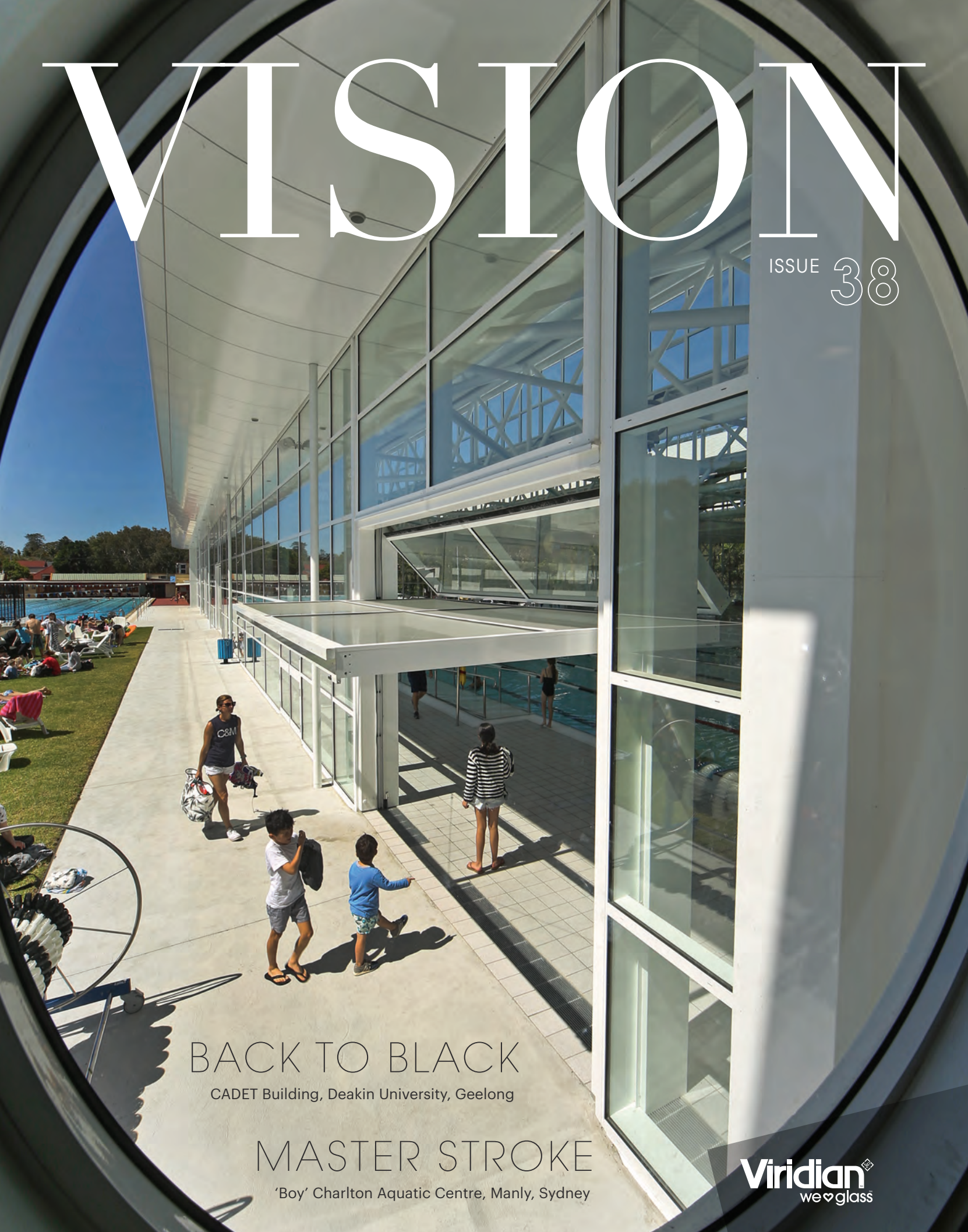
# VISION

ISSUE 38



## BACK TO BLACK

CADET Building, Deakin University, Geelong

## MASTER STROKE

'Boy' Charlton Aquatic Centre, Manly, Sydney

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CADET Building, Deakin University, Geelong

Deakin University's new CADET engineering building near Geelong is a model in refinement and light. In all it's a cool, interactive platform for engineering academics and students to advance their field of study. A veiled 'skin' of steel and Viridian performance glazing help create an elegant machine for learning.

CLICK TO VISIT
CADET BUILDING


# 24 MASTER STROKE

'Boy' Charlton Aquatic Centre, Manly, Sydney

The Manly Andrew 'Boy' Charlton Aquatic Centre is all chrysalis lightness thanks to its taut steel framework and barely there Viridian glass work. Michael Davies of Tompkins MDA Architects (now Michael Davies Architecture) has delivered athletic refinement and sparkling clarity – a perfect match of minimal enclosure for the natural elements it hosts.

CLICK TO VISIT
'BOY' CHARLTON
AQUATIC CENTRE


BACK

# TO BLACK

Universities continue to host some of the nation's best, most investigative architecture. These tertiary institutions may eventually be seen as modern Medicis, patrons showing others how and where to travel.

**PROJECT**
CADET Building, Deakin University, Victoria

**ARCHITECT**
Gray Puksand

**PRINCIPAL GLAZING**
Double Glazed Units using
Viridian SolTech™ Grey and VFloat™ Clear (facade)
Viridian VLam Hush™ (partitions)
Viridian SpectraSeraphic™ (spandrels)

**TEXT, IMAGES & FILM**
Peter & Jenny Hyatt

A lightly armoured steel cloak might suggest enclosure rather than 'release' but inside Deakin University's Cadet building at Waurn Ponds Campus, it's revealing on all counts. As if to overturn and surprise expectations, the interior ripples with daylight like a cool clear pond.

Designed to help introduce student engineers to new ways of seeing their place of study and work, it's a project of big ideas, subtlety and nuance. A sharp form incorporates deft Viridian glazing to provide crucial strands of daylight, shadow and view. Accessed by a ceremonial footbridge – any ideas of medieval castle quickly dissolve upon entry. Inside, thoughts of a cave become the experience of a treehouse. Here the lessons in light and shadow begin...

"The design universe loves black. It's emphatic. And unmistakable. There's no avoiding energized black among the beige. At least it appears to be the philosophy behind this recent project by Gray Puksand." So began our review in 'Dark Star' of the firm's Automotive Centre of Excellence at Melbourne's Docklands in Vision Issue 2, 2014.

Mezzanine-like spaces encourage virtually unobstructed sight-lines between circulation spaces and workshops.

“The project speaks the client’s language, feels accessible and inventive.”

VISION

Little has changed. That same edgy graphic envelope and sharp expression continues at Deakin University's CADET building on the outskirts of Geelong. Gray Puksand's design is compelling.

While the monochrome palette is repeated, everything else appears fresh and original – as expected of a firm that has shifted smoothly through the past couple of decades, accumulating an impressive project portfolio.

Rather than template, or overriding house style, the architects reveal how well they know this market segment. The project speaks the client's language, feels accessible and inventive. No mean effort in the pressure-cooker, commercial environment where value management regularly reduces diamonds to coal.

The $53 million delivers a 6700 sqm Centre for Advanced Design and Engineering Training (CADET). And for this grand sum it appears money well spent without corners cut or grand ideas lost.

CADET represents a transition from more traditional modes of learning and working to an innovative approach, where engineering education is embedded in research activity with an emphasis on design-based learning and industry collaboration. The focus is on enabling engineering students to experience real world scenarios, where an idea is developed from a concept, to prototype, to customised manufacture.

Gray Puksand worked closely with Deakin to deliver purpose-built laboratories, design studios, workshops and interactive learning spaces, furnished with industry-leading technology and equipment designed to enable students to creatively solve real-world engineering problems. Social spaces are also in the mix and academic staff work collaboratively in open plan office areas.

Right:
The intersection of transparency and opacity of the main east elevation entry accessed by footbridge.


KE
LEVEL 1

Mark Freeman, CADET project leader and partner at Gray Puksand Architects hopes many of the of lessons demonstrated in the building's design will be absorbed by students in all aspects of their study and eventual work. He speaks with Peter Hyatt about the role of a building designed for a keen relevance:

VISION **Is there one central project achievement above all else?**

MARK FREEMAN We worked collaboratively with our client to really re-imagine contemporary engineering education. They had a very clear understanding of the learning model they wanted to offer in parallel with our design. We're very much a part of their journey to transform undergraduate engineering education in Australia. That was really a key aspect of the project.

**You appear to have clear strategies where each elevation offers strong visual connection and solar/ thermal protection. The use of perforated metal screens on the western elevation appears especially effective.**

We wanted occupants to feel very connected to the outdoor studios and the outdoor learning environment. We maintain a fully glazed facade all around the building using a double glazed unit with Viridian SolTech™ Grey, and elements such as the screens on the western facade to add another level of control when the sun moves across the building, without decreasing the vision inside or out to the landscape.

Our design means the building does the work.

**Architects don't get to shatter the champagne bottle against the ship's bow before it slides down the slipway. How do you celebrate or recognise the moment when 'it's done'?**

One of my highlight moments on a project spanning several years was the transition staff made from existing academic premises into the new building. A challenge identified early on was to provide students with a contemporary and agile learning environment. We moved very quickly with the client to ensure a seamlessness of opportunity for staff and students; to bring them together as a community of academics and learners.

One of the key experiences is that on each visit, staff who had been working in very traditional workshop-type environments with old-school tools and machinery, now work in very clean, very high-tech, laboratory-type environments with state of the art equipment. They're loving it.

**Is there a standout area or aspect of the building for you?**

One of the most enriching and invigorating spaces is the central part of CADET where you walk into the multi-level design studio area. It's an area that spans several levels. No matter where you are, within that central design space, looking up, looking down, left or right, from that one point you can essentially witness and experience all the activities occurring within that building.

A suitable built vocabulary reveals connections and insights into the taught course. Perforated steel blades and Viridian Double Glazed units using Viridian SolTech™ Grey glass contribute mightily to ESD standards and spatial amenity.

"One of our key discoveries is how student behaviour can be modified by the spatial qualities of a building. There is a vibe within CADET and it's an environment that seems to calm student behaviour."

MARK FREEMAN, ARCHITECT

**What did glass give you here beyond the standard, subordinate, window in the wall?**
One of the keys to CADET is that the client didn't quite believe or realize what was actually possible. The way we have utilized glass so extensively internally and in a strategic way, really brings everyone together. It demonstrates a complete seamlessness between a multitude of classrooms and tutorial spaces. This is one of the greatest achievements of CADET, to utilise glass in bringing people together.

**Were there acoustic issues with so much glazing and open plan?**
Acoustics within CADET were a challenge. We worked collaboratively with a great acoustic engineer. Viridian acoustic performance glass VLam Hush™ (10.5 mm and 12.5 mm) as internal partitions made a huge difference. The challenges were more about the spatial environments being created and activities within these spaces. One of our key discoveries is how student behaviour can be modified by the spatial qualities of a building. There is a vibe within CADET and it's an environment that seems to calm student behaviour. They seem much less likely to raise their voices because they realize that they're very much on show in this building. The result is a relatively calm building and calm learning environment.

Above:
The double height north-facing entry reveals a combination of strategies to manage solar loadings and vista.

Raking daylight feeding into laboratory and workshop areas are crucial in eradicating Dickensian gloom and high-tech sterility.

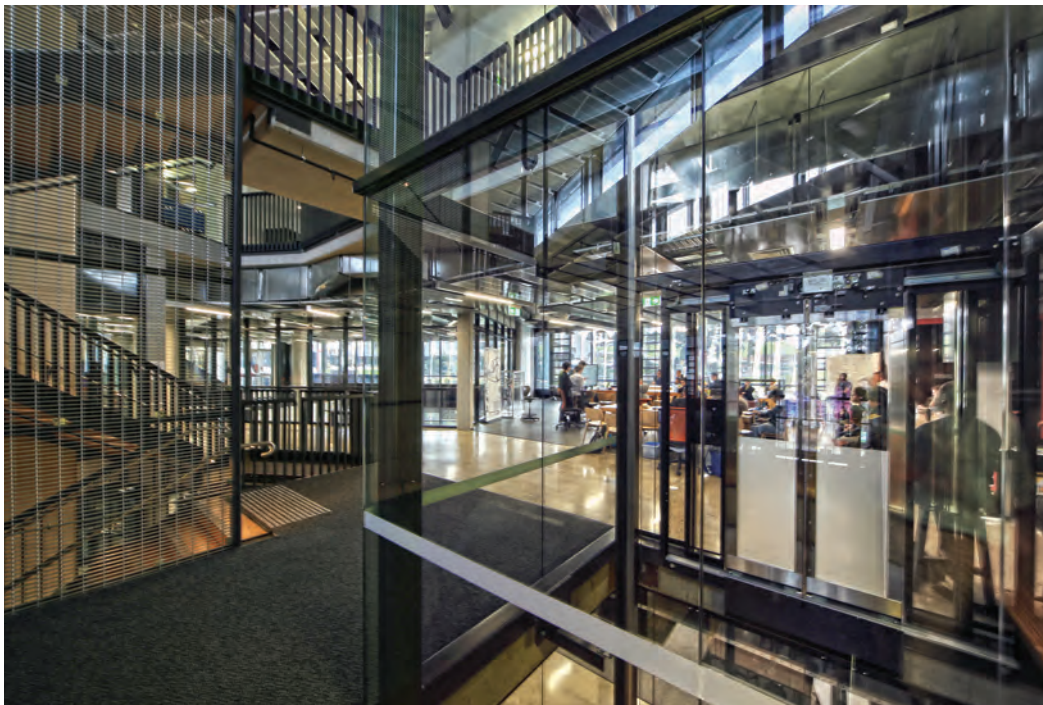
The west-facing elevation exalts the idea of intrinsic ESD performance devices rather than secondary additions to mediate solar loads.

**It's an interesting and unexpected consequence of the conventional idea of 'hubbub' that arises from many tertiary environments.**
There's an outside and inside story. The interior is very light, bright and very transparent. That partly came from the client who had a strong desire for a glass container. They felt this would allow learning to be visible to outsiders; for occupants to really show off exactly what they're doing.

**Was your intention to provide a thought provoking environment that would be absorbed into the consciousness of students?**
It was really about having a very connected and very close working community of learners within the building. One of the challenges with vertical learning campuses is you do tend to get a striation of functions and people tend to remain within their floor level. We strategically tried to make sure that people would flow seamlessly from floor to floor and they would do that, because they were provided with visual cues and visual stimuli in terms of what's occurring above and below.
We wanted to ensure that if activities were occurring on the floor below, that you could look down in a quite passive or an incidental way and just evidence what's actually occurring within the building. It's part of exciting students about the potentials for engineering.

> "The glass lift was to offer evidence of the build and directness of the building at all times and we did this throughout the entire building, to provide a very honest building."
>
> MARK FREEMAN, ARCHITECT

Images:
A light-filled core fills the central circulation core defined by the staircase and glass lift.



> “It brings together a community of engineering experts and academics and students in a way that has probably not been achieved previously in Australia. It is a contemporary, collaborative, and highly transparent learning environment.”

MARK FREEMAN, ARCHITECT

**What do you hope the building delivers as first and lasting impressions?**
It brings together a community of engineering experts, academics and students in a way that has probably not been achieved previously in Australia. It’s a contemporary, collaborative, and highly transparent learning environment. It leaves a very lasting impression as a very open environment of demonstrated creativity as you move throughout the building. The building is alive, very much so.

**How do you see the architecture assisting that whole teaching and learning process?**
I think in terms of assisting and supporting the teaching and learning process, it has been very much about making sure they had a really diverse range of learning spaces, and that all of those spaces had multiple layers. No one space has any one true purpose and the way that the spaces are configured and connected, seamlessly, is that they can also benefit from proximities and multiple functionalities. So that’s one of the key aspects; it moves away from traditional cellular, isolated learning spaces to a much more connected learning environment, both in a horizontal and vertical sense.

Images:
Staircases provided the added benefit of linking students and staff as they move throughout the building.

**You could be accused of a certain folly in requiring a central glass lift for example. Sceptics and doubters would view it as an act of extravagance.**
It's a great question. The glass lift was to offer evidence of the build and directness of the building at all times and we did this throughout the entire building, to provide a very honest building. It was important to demonstrate to students and staff that so many of the services and structure are all honest as are all of the materials used. There is a lot of engineering within the building at all times, and the glass lift is really one evidence of demonstrating movement within the building, the honesty of structure that contains the lift, and also, for the ability for people to move up and down seamlessly within the building and see what's going on as they move vertically.

**What was a real deal-breaker for choosing Viridian glass?**
For us it's really about the level of service we get from Viridian. When we're first sitting down at the table, what we really find beneficial at the front end of a job is to be able to work collectively to understand and remove challenges and make them become opportunities. I think the biggest challenge was that the client really wanted a completely glass, glazed box. Climatically that wasn't achievable, but we were able to work with Viridian to ensure we could give the client as much glass as possible externally, but in a very controlled manner without being convoluted or over-designed.

**PROJECT**
CADET Building, Deakin University, Geelong

**DESIGN**
Gray Puksand –
Mark Freeman, Paul de Podolinsky, Sian Wright, John Pinkerton, Grant Hobson, Tjaia Oey

**STRUCTURAL & CIVIL ENGINEERING**
Irwin Consult

**LANDSCAPE ARCHITECT**
Rush Wright Associates

**ESD CONSULTANT**
GHD

**PRINCIPAL GLAZING**
Double Glazed Units using
Viridian SolTech™ Grey and
VFloat™ Clear (facade)
Viridian VLam Hush™ (partitions)
Viridian SpectraSeraphic™ (spandrels)

**WINDOWS**
Westcoast

**BUILDER**
Cockram

**CONSTRUCTION BUDGET**
$34 million

**TOTAL BUDGET**
$53 million

**TEXT, IMAGES & FILM**
Peter & Jenny Hyatt


CAFE
BEACH ENTRY

# MASTER STROKE


FAST
LANE

Manly is defined by its world famous surf beach. Low key, low-rise development on this part of Sydney's northern shore hasn't hurt its reputation either, sparing its golden sands the kind of trophy tower overshadowing as Dubai-on-Broadbeach.

**PROJECT**
'Boy' Charlton Aquatic Centre, Manly, Sydney

**ARCHITECT**
TompkinsMDA Architects

**PRINCIPLE GLAZING**
Double Glazed Units using
Viridian VLam Clear™

**TEXT, IMAGES & FILM**
Peter & Jenny Hyatt

No surprise it's a low-rise project that echoes the best of modernist traditions, fully expressing its assembly and celebrating the natural qualities of place in climate and water.

Despite its size, the centre is in keeping with the suburb's scale and fabric and the architecture while modern, retains a certain timeless civic quality. Its sparse forest of Miesian-inspired white steel is highly transparent and flexible. Extensive openings by way of bi-folding glass fire-station type doors, quickly convert filigree structure into a sequence of seamless inside/out spaces.

Viridian double-glazing performs a signature role of crisp transparency and ability to deal with the centre's exposure to climatic extremes. The existing outdoor aquatic centre – dating from the design of Figgis and Jefferson Architects in 1974, now offers a diverse range of training and leisure options. Outdoor facilities comprise a 50 m x 8 lane competition pool also used for water polo, a children's wading pool and a 25 m pool.

The centre faces due north over Kenneth Road towards the Manly Golf Club and is now entered from the north, rather than Balgowlah Road in the south as used to be the case.

Vision's Peter Hyatt speaks with Michael Davies of TompkinsMDA Architects about his design, less as style than facility fully fit for purpose and place:

VISION **What's the key to projects where you are working towards making structure dissolve and disappear rather than the heavyweight impact?**

MICHAEL DAVIES One of the things I really like about community work is that at the end of the project, if it's successful, you feel that you've contributed something to the people who use your building. That's always been very important in the work we do. This is a light building in so many ways. It is about architecture that feels uplifting and optimistic and caters for a really diverse range of community needs. We didn't want the building to get in the way of that. Our role is to facilitate activity and that dissolving and disappearing of mass that you describe is part of that process.

**All architecture is a series of obstacles to be overcome. Are there any particular obstacles you had to hurdle or, in this case, swim past?**

Well, this has actually been one of the most difficult projects of my whole career. The site was highly constrained and we eventually found rock beneath the site, one metre deep at one end and 18 metres deep at the other side. The building sits on bored piles and that delayed the project somewhat. In addition, it knocked the budget about to some extent as well, very early in the piece. Other than that, the design stage was relatively trouble-free.

**What do you consider the project's standout qualities?**

I think the interior space is probably the most important aspect. The building, by the nature of the site, became triangular. It's more or less a 45 degree triangle. We struggled structurally to avoid a column midspan of the longer span. The longest truss is 62 metres long and it's 3.6 metres deep. It's basically a conventional sawtooth roof. The important part about it is that there's daylight directed from the south, so that there is no need for lights during the day, yet direct sunlight that would reflect off the water surface is not admitted. The building has immense volumes of daylight, like all the other centres we have done. I think that, together with the scale of the space, indeed, the enormity of the space, if you like, is the most successful aspect.


"One of the things I really like about community work is that at the end of the project, if it's successful, you feel that you've contributed something to the people who use your building. That's always been very important in the work we do."

MICHAEL DAVIES, ARCHITECT

**There's almost a paradox here of achieving a huge volume yet keeping a scale that avoids any sense of a shopping mall. We're in the age of mega-structures and everyone wants the whopper. You strike a good balance of user fit and scale.**

Thank you. I think the most the important thing about this space is that whilst it is very large, it has many different activities within. There's also a 1.2 metre split between the upper ground floor (entry) level and the lower ground floor. The upper floor has the leisure pool, the change rooms and the sauna /spa suite. The leisure pool incorporates a number of different architectural forms including a wave wall, along with an assortment of water features. The pool floor is patterned and coloured in a composition influenced by the work of Wassily Kandinsky.

**So, it's a little big structure, or big little structure?**

I think it's a successful space insofar as it is divided vertically with all levels able to be perceived at once and articulated by the cylindrical form of the kiosk and the wave wall we talked about before. Unlike say, a shopping centre, the outlook is through glass.

On the north side, we have about 65 metres of glazing which is six metres high and faces north and looks out onto the existing outdoor pool. On the south-east side, again, there's a huge glass wall that faces onto landscaping. Beyond that central space it is very open and gains daylight from the roof-level glazing as well.

"The reason we get so much satisfaction out of this building type is because it involves people having fun."

MICHAEL DAVIES, ARCHITECT

**Hopefully it's instructive and informative.**
Well, that's certainly true. The reason we get so much satisfaction out of this building type is because it involves people having fun. It's terrific when the building has had a difficult start-up time as this one did, to see it finally open and people enjoying it to such an extent. The one thing I like about the management at Manly is that they seem to leave the water features on, they don't turn them off and have sessions. There's a lot for young kids to do here. The 25 metre pool's also being used by the fitness swimmers, who didn't want the centre in the first place. It's exciting to see people using your building and getting so much enjoyment out of it. It contributes to one's sense of usefulness.

Images:
The view from Balgowlah Road reveals a swim and activity centre of crystal clarity.


MANLY ANDREW
'BOY' CHARLTON
AQUATIC CENTRE

**Glass is quite a critical component in your design.**
I love glass, it's a simple and ancient material which just gets better and better. Because we decided to have such large areas of glass, the insulation issue was really very important. The way we went about that was to use a performance specification. We set out the U-Value for the builder who was given the option of selecting products for our approval, which complied with that.

I was very pleased when they chose to use Viridian and they also elected to use double-glazed units. What we have throughout the building, and there's a huge 1400 m² area of it, is 6.38 mm of laminated glass, 12 mm of argon gas, and 6.38 mm laminate again. It's all clear glass, which I'm very happy with, and it's double-glazed throughout. There's a huge area of double-glazing throughout the building, which is why it's so crisp and clear.

**Any other pool related issues to consider with regard to glass and structure?**
Since the advent of Section J, sophisticated glazing has become very, very important in order to provide sufficient insulation. In most aquatic centres the pool hall is heated to one or two degrees above the pool water temperature. In this particular case, it's able to be heated year-round and certainly during winter to 30°C.

The consequence of this is that in the early winter mornings, particularly in a district like this, there are potentially high levels of condensation on the glass which, once mixed with the chloramines in the pool hall atmosphere, has the effect of creating corrosion on the structural steel. Insulation of the building is therefore very, very important. In this case, we have a very high level of insulation, together with a very sophisticated protective coating on the exposed steel structure.

Images:
Extended wind hoods and gills project along the north west elevation to create colour mural.

**'Transparency' appears to be the new mantra for this kind of project.**
It was very important in the integration of the new indoor centre with the existing outdoor facilities, and the general integration with the outdoor environment in this case. Our experience is that people actually don't like indoor heated pools, particularly in summertime, which is why we have those very large doors. Transparency and daylight is an important part of people enjoying the space. Transparency is achieved by the external window glazing and also by the use of glass balustrades internally throughout.

There are a lot of balustrades in this building across the two levels and at the changes in level, all with 12 mm toughened cantilevered glass and stainless steel handrails for support. Viridian were great in explaining the various glass support methods we adopted, and on their advice, we left the final design to the contractor in accordance with the code.

"I love glass, it is a simple and ancient material which just gets better and better. Because we decided to have such large areas of glass, the insulation issue was really very important."

MICHAEL DAVIES, ARCHITECT


CAFE
WET FLOOR
WET FLOOR

The aquatic centre features a diversity of recreational and training areas. View north with Balgowlah Road on right. A tight triangular site defines the overall masterplanning of the facility.


BEACH

**Do the environmental challenges inside and out make this one of the more feared and difficult building types for the architect?**
There's no question about that – it is a very specialised area, which luckily, clients are starting to realise, due to the large number of failures. There are lots of technical issues. Mechanical ventilation is a major one insofar as you've got to get the right number of air movements through the pool hall and that's a lot of air being moved about. We try to avoid the typical engineering solution of running huge circular ductwork all over the place.

At Manly and in most cases, we supply the warm air at low level through a series of under-floor masonry plenums and the air is forced up the internal face of the glass, which helps to alleviate condensation in winter.

**Any other issues that spring to mind?**
There are lots: Corrosion is probably the major issue, which is linked to some extent with the mechanical ventilation which can be used to assist and reduce the corrosive vapours. The way the building is detailed is also an important way of reducing condensation, horizontal surfaces on which condensation can collect are a no-no and as I said before, insulation also helps to reduce condensation and therefore, corrosion. There are also serious acoustic issues in this building type, which can impact on safety and user comfort.

The interaction of these and many other physical issues is very interesting and another reason why we get so much enjoyment out of designing and delivering this type of building. There have been a lot of failures in this building genre. Touch-wood that hasn't happened to us. Certainly, we've learnt a lot having done six such buildings over a period of 25 years, but you never stop learning and the knowledge gained to date has all been incorporated in this project.

"Transparency and daylight is an important part of people enjoying the space. Transparency is achieved by the external window glazing and also by the use of glass balustrades internally throughout."

MICHAEL DAVIES, ARCHITECT

Left:
A simple saw-tooth roof provides long, uninterrupted spans and uncluttered pool areas.


Images:
Structural elegance and diamond clear glass dissolve the more common barrier between inside and outside experienced at such facilities.


**PROJECT**
'Boy' Charlton Aquatic Centre,
Manly, Sydney

**ARCHITECT**
TompkinsMDA Architects

**LANDSCAPE ARCHITECT**
Lorna Harrison Land Architecture

**STRUCTURAL AND AQUATIC ENGINEERS**
Geoff Ninnes Fong and Partners Pty Ltd

**BUILDING SERVICES ENGINEERS**
WSP Buildings Pty Ltd

**BUILDER**
FDC Construction & Fitout Pty Ltd

**GLAZIER**
South West Aluminium Pty Ltd

**GLASS BALUSTRADES**
Stainform Pty Ltd

**GLASS SUPPLIER AND SPECIALIST SUPPORT**
Viridian

**PRINCIPAL GLAZING**
Double Glazed Units using
Viridian VLam Clear™

**SIZE**
456 m²

**CONSTRUCTION BUDGET (NOTIONAL)**
$15 million

**ESTIMATE FINAL COST**
$25 million

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viridian@csr.com.au

TEXT, IMAGES & FILM
Peter & Jenny Hyatt
www.hyattgallery.com.au

GRAPHIC DESIGN
Nexus Designs
www.nexusdesigns.com.au



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