Energy

PROJECT

Kerrie Murphy Building –
The International Grammar School, Ultimo, Sydney

ARCHITECT

Allen Jack + Cottier Architects P/L

DESIGN TEAM

NAME

Michael Heenan

ROLE

Principal and Design Architect

NAME

Cameron Webb

ROLE

Project Manager

NAME

Yan Xing

ROLE

Architect

BUILDER

Baseline Constructions

CONSTRUCTION MANAGER/PROJECT MANAGER

Long Huynh

PRINCIPAL GLAZING CONTRACTOR

Leda Aluminum

PRINCIPAL GLAZING RESOURCE

Viridian

DESCRIPTION OF PRINCIPAL GLAZING

10.38mm laminated Viridia ComfortPlus neutral Low-E glass, waterjet cut to size and shape to 'Amoeba' windows.

6.38mm laminated Vidian ComfortPlus neutral Low-E glass to areas of aluminium framed glazing.

Sealing of unframed edges of 'Amoeba' windows was a requirement of Viridian – edge detail of window included flexible structural silicone perimeter seals tapered to outside face of glass.

'Amoeba' windows were cut to four different sizes, none rectilinear, ranging from 0.2sqm. to 0.97sqm.

Viridian ComfortPlus Neutral to 'Amoeba' window glass and aluminium framed glazing, with Woodland Grey seraphic to spandrel panels to aluminium framed glazing. Fixing detail to frameless 'Amoeba' windows was developed by AJ&C in conjunction with 3M and Baseline constructions and is a world first.

PROJECT COST

3,000,000

STIMULUS PACKAGE

Text – Peter Hyatt
Photography – Michael Nicholson

Allen Jack+Cottier is an architecture practice familiar with the design world's centre stage. In 2009 they won the World Architecture Festival's Sports Category for the Berry Sports and Recreation Centre on the NSW south coast. Its concrete walls punctuated with floating, amoeba shaped windows, wowed the jury with its stellar connection to the bush and sky.

The firm is also winner of Viridian's Vision Awards 2011 Commercial Energy Efficiency category with its design for the Kerrie Murphy Building – a four level multi-purpose primary education facility – part of the International Grammar School in Sydney's Ultimo. Once again, principal and design architect Michael Heenan calls up an instinctive, organic design to create memorable, stimulating learning spaces.

Michael discussed the project with Vision editor Peter Hyatt:

Viridian
New World Glass

CSR

You're earning a reputation for punching holes in walls and roofs - and winning awards.

I suppose we are, but every building grows from its site and requirements. It's not something we contrive.

You appear to be changing the way windows and walls are considered.

It began as a contrasting play between the mass and weight of concrete with the liveliness and lightness created by the glazed amorphous openings.

There is an art to that though, in being able to bring alive a basically inert, difficult skin.

We architects are intrigued with the qualities of concrete and persist with using it despite its obvious shortcomings - cracking, shrinking, chipping and low insulation values. Contrasting concrete with glass with its absolute precision, beautiful reflective properties and ability to change its energy ratings and U values and everything that glass is capable of is the thing that I am most interested in.

There is that liberating quality with glass, to be much more than the hole left over by the builder.

The story of this building is the story of glass. People think glass is glass, but it's not. You order up your U value, solar heat gain co-efficient, strength and colour so that when you look at IGS it looks like all of those windows are the same but they're not – they've all been ordered to do a specific job. It's a collage of glass down there even. though it doesn't appear that way.

You have very effectively broken down that institutional vision of education. It's a very plastic, organic solution. Of course the $64 question is, does it work?

I hope nothing comes out of this office that doesn't work beautifully. We don't set out to do a great building. We do everything on the way through as well as possible. The environmental engineer is sitting with us on day one. It's an integrated approach where everything works first and then hopefully a good building pops out.

This forward looking, innovative school is designed for primary school kids and there should be a joy and excitement and discovery about learning at that age and this is deliberately reflecting that.

Tell me about the process because you had a frantic deadline to pull this together.

The design came about very quickly. The building is a result of the Building the Education Revolution. I was briefed by the school at midday on a Tuesday. I walked around the suburb of Ultimo for three hours to think about the essential characteristics of the area. I had this feeling that the area

The play between tough arrogant concrete and the absolute precision of glass is something I'm interested in.

Viridian

had deteriorated since the 1940s and it dawned on me that the power and strength of the suburb came from the giant brick warehouses that formed the basis and grain of the place. I wondered if I could do a building that reinforced that history. Now I feel it has a reverence to the site and suburb's history. I then, spoke with our environmental engineer, I got home at about six and started work designing. I worked pretty well through the night, built the 3D model on the computer, put a montage together and at 2pm the next afternoon presented to the board the entire building – the shape it is, sections, elevations plans at every level and an estimate of cost. They were delighted and said 'get going'. So 26 hours after we met to discuss it, there it was.

There's also a lot of technology concealed within this lovely form. The teardrop glazing is quite a work of art.

It was a lot of fun working out those windows. Could glass do that and be cut by water-jet into the pattern I wanted? Could it have the right requirements of light transmission and solar gain? My image of this building was to have splashes of water or perfectly formed droplets on the surface. What I wanted to do was not allow the arrogant concrete to acknowledge the presence of the glass. The glass appears to be just stuck on. We had to make sure the seraphic coating on the glass would stick to the 3M tape, and that would stick to the Nawkaw which would stick to the concrete - so one depended on the other. In fact we believe this is the first time anywhere that VHB structural glazing tape has been used in this way to stick the glass to the building. The only test that 'failed' was the tear test. The VHB tape was so strong it tore off bits of concrete. Viridian laminated ComfortPlus™ was put to the test to achieve our design intention.

There is a really rough hewn, Flintstone appearance to the concrete walls.

What the glass allowed us to do and the method of attaching the glass, was to almost remove the apparent existence of the glass – especially from the inside. It appears that we have just punched holes in concrete. That Flinstone quality you refer to is really what we were after, so were the kids!

What about glare and the apparent absence of window coverings?

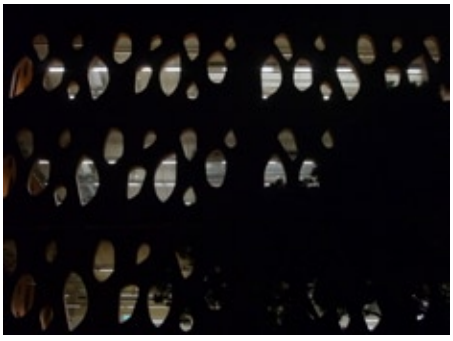
A lot of that concern is eliminated by the high performance glazing used. We carried out detailed glare analysis of the building. We drew the floors and desks and computer modeled the glare co-efficient about eight times during the year at various times of the day. The heat build isn't an issue because of the U value and the solar heat gain coefficient in the glass. We prefer the visible light transmittance relatively high – around 60-70 %. Where there are glare issues, we have a line of continuous black blinds tucked in under the raw concrete ceiling which when down are still see-through.

It has to be a whole considered environmental package of course rather than applied bits of image making.

Even though the glass appears to be stuck on, there is a whole other lot of glass used throughout the building, so in all four corners there are operable louvres backed up to a building maintenance unit, which allows the school to select between natural ventilation and air-conditioning mode.

You mentioned that there is a multitude of glazing types. What about the fire-stairs?

Because it's a school we required two sets of fire stairs at either end of the building and that would have ruined the planning completely. On the ground floor we have arts and crafts classrooms, the second floor is library, the third is staff quarters, fourth is the hall and top floor is a future playground all entered from one end. What we did was to build two stairs in the one shaft in a double helix arrangement. Using Viridian glass externally, we have a wall of glass that creates a really wonderful circulation zone. Viridian's Pyrostop™ is a relatively new product and that allows views from one staircase to the other within the shaft. Great fun for kids.



The walls aren't exactly as they seem are they?

It appears to be a pre-cast concrete building with high quality glass and you think well, that isn't going to work because concrete doesn't have any insulation values. In reality the concrete has been designed as a composite panel made up of 180mm of concrete on the inside, 50mm of high density polystyrene and then another 60mm slab forming the outer skin, making a perfectly insulated panel. It's also perfect because the mass is on the inside and then the insulation is on the outside and then effectively a reflective layer on the outside of that. We can do a night purge where we trickle in free cool air between say 3am and 4am through the building, via 40 or so windows open just 50mm or so, and it cools the whole building ahead of time. This reduces the radiant energy that you feel and means you can be in natural ventilation mode more often.

How has it been received?

All the teachers were down there during our walk around and there was a terrific acceptance. That was extremely gratifying.

You were really fast-tracked through the planning process.

We were. We sat down with the Lord Mayor of Sydney Clover Moore and Director of Planning Graham Jahn and they gave us every support imaginable. They knew that if it went through a traditional path this could never have been built in time. With this building there was the option of approval through a State Government integrated project office. However the Sydney City Council approved the project in a little over a month, proving that the normal four to six months is not necessary.

Water cut glass is really thinking outside the square. How was it fitted?

The glass had to work incredibly hard. Quite apart from being instrumental in helping achieve all of the energy rating requirements we had to see that the glass was cut perfectly, factory fitted onto the panels and then transported to site. That's when it was most under stress.

Which raises the question of cost of course: Is this as horribly expensive as we might imagine?

This building works out at around $2,700 a sqm. The average Building the Education Revolution public school hall has come in at $3,300 a sqm. That means that ours is an extremely frugal building. Really there are only four different types of panels fully finished and glazed that formed the building – from being on the truck to forming a whole level took just three and a half hours. Yes, it's expensive glass and an expensive system, but there are no frames and no on site installation. It's only a little more expensive than a standard glass window.