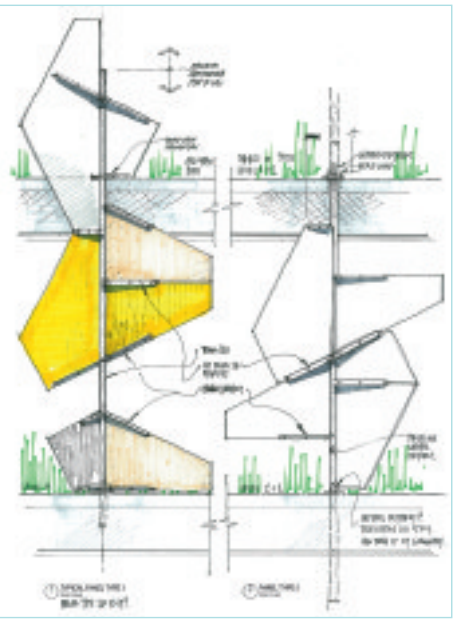
PIXEL PERFECT

Awarded the highest-ever score from the Green Building Council of Australia, Melbourne's Pixel Building could well be the world's greenest. **Rob Booth** reports

Left: multicoloured panels are used for cladding and shading. Below: a cross-section of two typical panel types



Australians love a world-beater, whether Shane Warne with a cricket ball or Ian Thorpe in the swimming pool. The same voracious competitive drive seems to be coursing through the designers and owners of what is claimed to be Australia's greenest building. Not content with receiving the first-ever maximum score from the Green Building Council of Australia (GBCA) for its environmental credentials, the team behind Pixel, a four-storey, 1,000m sq office development on the edge of Melbourne's central business district, want to lay claim to the title of the world's greenest building by testing it against US and UK rivals. And like any good Aussie competitors, they are brimming with confidence.

Since completion last August, the building, on the site of the disused Carlton Brewery, has been unmissable on the skyline as the architects have produced a cladding and shading system that makes an otherwise rudimentary glass cube bristle with colour and form. Not every architecture critic has been impressed, but looks are not the point. The AUD$6m (£3.9m) building is rammed with so many environmental innovations that its developers believe it will render British and American efforts to maximise building sustainability pale by comparison. Its admirers already include US secretary of state Hillary Clinton and Gavin Jennings, Australia's minister for the environment, who attended its opening.

Developer Grocon initially conceived the building as a 'laboratory' for green innovation and plans to use it as a headquarters for its development team building out 300,000m sq of office space on adjacent sites. It promises to be completely carbon neutral, using solar panels, windmills and intelligent ventilation. There will even be enough energy produced on site to pump surplus back into the grid and to offset the carbon consumed in construction, which itself has been reduced through a new kind of structural concrete using recycled aggregates that Grocon says halves the embodied energy.

Solar photovoltaic panels will be mounted on a tracking device to follow the sun at all times of the year, delivering an estimated 40% extra energy, while new kinds of wind turbines will catch the city breezes and are said to outperform all other 1kW turbines now in worldwide production. To avoid the need for unnecessary cooling, the windows will be fitted with 'smart' technology so they open automatically on cool nights, allowing air to flood into the building and cool the structure in what the engineers call 'night purging'. The occupants won't even need to think about it.

All this doesn't come cheap, though, and Grocon has calculated it cost 16% more to build than a building classified as 'Excellent' under BREEAM. Neither can anyone be sure about how it will perform once fully occupied (only the ground floor is currently in use, as a sales suite for an apartment block). Nevertheless, Clinton has declared the building a model for the environmental performance of new embassy buildings being planned around the world. 'I am sure that many Australians — and, frankly, Americans and others — will be studying the Pixel Building example,' she said after a visit to the site last November. 'Certainly the State Department will want to send our experts to delve into greater specificity with you, because we are committed to building environmentally sustainable embassies all over the world.'

Nothing, it seems, is going to waste: if Melbourne enjoys average rainfall, the building could in theory be completely ››

disconnected from the mains water supply without its users noticing the difference. Water falling on the building will be collected after use to irrigate the green roof. It will be stored in tanks and treated by reverse osmosis to drinkable standards before being distributed through the building. So-called grey waste water from sinks and showers will be used to irrigate reed beds and other plants on site, dramatically reducing the amount that will end up in the city's sewers.

For hot water, the designers have arrived at a remarkable solution: it will be warmed by heat derived from methane that itself will come from euphemistically termed 'black waste' from toilets, as well as kitchen waste. The system is made possible by the use of vacuum toilets, which reduce water consumption dramatically. A tank on the ground level of the building will hold all the black waste, then the methane will be extracted and used to fire water heaters on the roof. The remaining black waste will then be sent to the sewer with reduced methane levels. The system has proved problematic in the early days, however, with concern that the methane filter may not be up to the job.

Grocon is working towards an application for a BREEAM rating in the UK this summer and a LEED rating in the US, but the building already has a top six Green Star rating from the GBCA. It was the highest score ever awarded by the council and the building was garlanded with praise. At an event to mark its opening, Romilly Madew, chief executive of the GBCA, called it 'a masterpiece'. 'The Pixel Building could arguably be said to be Australia's greenest building and is quite possibly the first building of its kind in the world,' she said. 'This building will redefine the way buildings are built in the future.'

It is now aiming to achieve the highest scores ever by the US and British measures of environmental performance, making it first among more than 700,000 schemes assessed under the three systems. David Waldren MRICS, building manager for Grocon, is proud of Pixel's achievements so far, but admits a truth familiar to anyone involved in green design: the wrong kind of occupancy could produce a far less impressive performance. 'Our calculations do not allow for 80 people moving onto one floor, bringing 80 computers, 40 printers and 80 mobile phone chargers,' he says. 'If you stack it with lots of energy-hungry stuff you could derail the process. If a bank moved in with a trading floor and a data centre there will be a completely different outcome.'

Grocon believes an occupier who wants to help hit the target of carbon neutrality is more likely to be attracted to the building. Understandably, the early days have not been without snags. Waldren, who is to be made a Fellow of RICS as a result of his efforts on Pixel, also admits to causing many of the developer's top Grocon executives to overheat in one meeting, in what he remarks drily could have been a 'career-limiting' decision — he seated more than 30 of them in a space intended for 15, with temperatures in the upper 30s and high humidity in Melbourne.

'There was criticism that there wasn't enough air-conditioning in the building,' he says. 'Everyone was getting extremely hot but you live and learn.' Surely the executives were sympathetic? 'Most of them were, but it's an Australian tradition to get a bit of a ribbing.'

The designers of the Pixel Building all hail from the state of Victoria: architects Studio 505, sustainability and services engineers Umwow Lai and structural engineers VDM Consulting. The same design team is now working on a 10-storey, 50-apartment development on the same disused brewery site, importing European cross-laminated timber technology and the carbon neutral PassivHaus standard. Pixel is barely up and running, and the Australians are already looking to the next generation.

pixelbuilding.com.au

Right: concept designs for Grocon's next two schemes on the Carlton Brewery site, the Delta and Portait apartment buildings. Below: Pixel uses innovative wind turbines to catch city breezes

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