

New Perspective

Many companies claim to have environmental sustainability as a core business value but very few can display evidence of it as powerfully as PTW Architects. From the refurbishment of 259 George Street to the design of Watercube - the Beijing Olympic Aquatic Centre - every project the firm undertakes is a physical expression of this principle.

'Energy and resource efficiency is the driving force for many of the decisions we make,' says Terry O'Rourke, senior architect for the new look 259 building. 'Even down to the toilets. The old automatic urinals flushed every five minutes, using too much water. So we installed waterless urinals.'

John Bilmon, Director of the architectural team for Watercube, says that Olympic architecture has enormous power to raise awareness of issues such as environmental sustainability. 'Because they're so in the public eye, Olympic buildings are truly defining buildings, icons of their age,' he says. 'China took the opportunity to express ideas and aspirations through the design and construction of Watercube, which represents the possibility of a sustainable future.'

The design consortium for Watercube - PTW Architects, consulting engineers, Arup, and China's CCDI - used materials that reflected the latest thinking in energy efficiency. 'The walls and roof are made from a transparent material called Ethylene Tetrafluoroethylene (EFTE),' says John. 'It's a strong but lightweight form of plastic developed by NASA. Using less weighty materials means less structure is needed to hold the building up, reducing its carbon footprint.'

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PTW Architects pays more than mere lip service to the issue of environmental sustainability

a human hair. 'Two of these sheets were captured in a frame,' says John. 'Then air was blown into the space between them. The building looks like soap bubbles stacked upon each other - imagine a building made of bubble wrap!'

The 'soap bubble' design was intended to reflect the theme of water but the architectural team had also agreed that the building would act as a kind of insulated greenhouse. 'Using transparent materials allows natural light and heat to enter the building,' continues John. 'The exterior walls and roof are also heated by solar energy. We designed deep walls and roof structures so that we can capture the heat within the wall cavity, as well as the hot air that rises into the roof. We can then redirect it either back into the pool hall or outside, reducing heating and air conditioning costs.'

Engineers were also able to track the sun and work out when more or less energy would be needed inside. 'The team designed patterns of aluminium dots on the EFTE, called Frit patterns,' says John. 'These patterns control the amount of energy going into the building and also allow us to direct it onto the pool to heat the water up. More dots reduces the amount of clear space on the EFTE and stops the heat getting in. Smaller dots, or more space between them, allow more light and heat in. All in all, we've reduced energy consumption by 30 per cent.'

The space age material was also used closer to home in the 259 refurbishment. 'We used EFTE in two canopies,' says Terry. 'Over the escalators that take you from the food court level up to Lang Street, and also over a flight

of stairs, from the George Street forecourt up to Jameson Street.'

Coincidentally, John was the original architect for 259 George Street. 'It was my first ever high rise project,' he says. These days, he has become somewhat of a celebrity in China. 'I've been working in China for over 20 years, but Watercube has enhanced my reputation. Everyone knows Watercube. I was recently mobbed by about 500 people asking for my autograph! It was surreal.'

Since it began in 1989, PTW Architects has become one of the largest architectural firms in Australia with offices in Sydney, Abu Dhabi and across Asia. Their team also designed the Sydney Olympic Aquatic Centre, but Watercube is five times the size. 'It's also designed to be ideal under seismic loads,' says John. 'One 'soap bubble' joins three and they each go on to join three others, so any force is dispersed.'

John believes in the power of a building to send out a message about the future.

'We've designed Watercube at a time when China is becoming very aware of its physical environment,' he says. 'The Chinese people now see what good design can do and achieve. This creates in them the ability to choose the way they live within their environment. They'll be a lot more discerning about environmental issues now.'

Words: Kate Johnston