

# Grand designs

There is energy in the air Down Under with the focus on the long-needed modernisation of healthcare facilities – and at the forefront is good design. **Kathleen Armstrong** reports

There is a boom in Australia – and it is not just in the export of natural resources which have enriched the island continent. Over the last few years, and especially since the election of the Labor Government in 2007, money has been flowing into the regeneration of healthcare facilities throughout the country, bringing old stock into the 21st century.

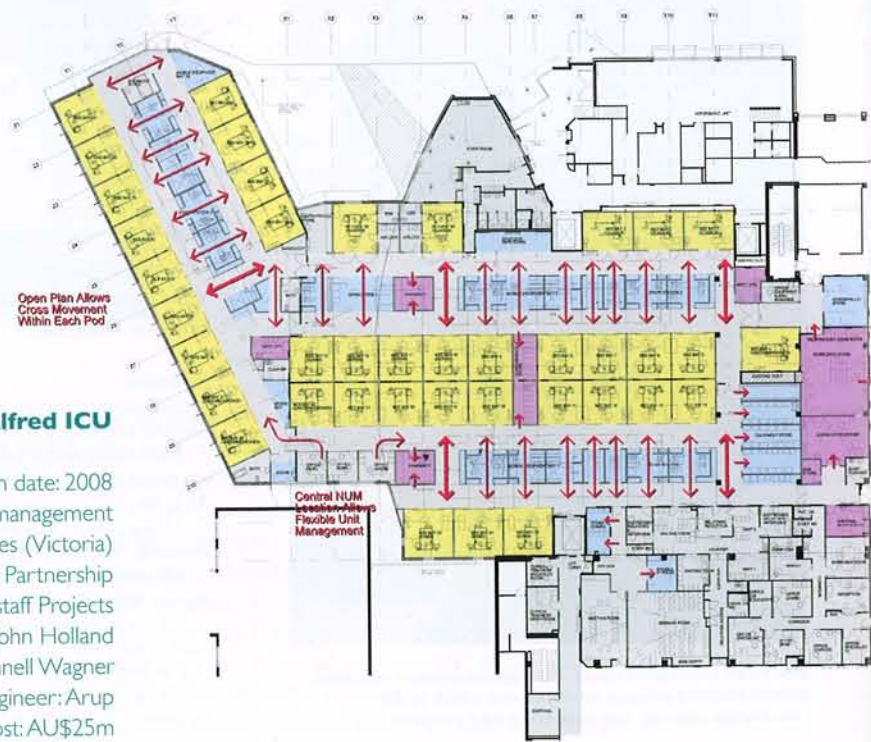
One of the most urbanised countries in the world – over two-thirds of the population lives in its major cities<sup>1</sup> – it faces many of the same issues impacting on the provision of healthcare as western Europe, the US and Canada. But the picture is complicated

by a regional and rural population that is often remote and widely dispersed.

The healthcare system is a mix of public and private sector providers and funded through a mix of Commonwealth (national government), state and private insurance funds. A universal healthcare system, Medicare, was introduced in 1984 (it first made a short-lived appearance in 1974) but since the mid-1990s, policies have been introduced to encourage people to take up private insurance and use private hospitals in order to help reduce the pressure on the public hospital system. In addition, many states have begun relocating primary care into 'super-clinics', shifting the cost of care to the Commonwealth government<sup>2</sup>. In June 2007, Australia had 1,301 hospitals, of which 758 were public and 543 were private<sup>3</sup>.

Ageing hospital stock, much of which had not been refurbished since the 1970s, and an ageing population, have led to the current focus on updating and redeveloping the healthcare infrastructure. In 2006 the Government endorsed the *Australasian Health Facility Guidelines*<sup>4</sup> which provide recommended design guidelines for health facilities in Australia and New Zealand. The guidelines effectively cover room size and layout and have been critically received by some architects who say they can be too restrictive and have not changed to meet current trends.

According to Ronald Hicks from Rice Daubney, there is an increasing emphasis on "square-metre response" to a brief. "Schedules of accommodation often don't have the level of creativity architects



**Alfred ICU**

Project completion date: 2008  
 Contract form: Construction management  
 Client: Department of Human Services (Victoria)  
 Architect: Billard Leece Partnership  
 Project manager: Johnstaff Projects  
 Main contractor: John Holland  
 Structural engineer: Connell Wagner  
 Services and environmental engineer: Arup  
 Cost: AU\$25m

Plan illustrating staff workflows at the Alfred ICU



Large roof lanterns and switchable glass fill the Alfred ICU in Melbourne with natural daylight

would like to see," he says. However, creative designers will often find a way round the restrictions – and Liverpool Hospital is one such example.

The architects (Rice Daubney) were able to contribute to the clinical model as they were brought into the project at an early stage. The hospital has an open concourse, like an airport departure hall, Hicks says, making it easy for patients to find their way to clinics. The hospital also incorporates vertical stacking of specialties. And there is a greater emphasis on interventional imaging, bringing it into the theatres in response to input from clinicians.

"Although it is not a totally original approach, it has been applied in an innovative way," Hicks adds.

Rice Daubney used a 3D-CAD building information model (BIM) to enable end users to see more realistic images of proposed designs. Hicks says it has radically improved the delivery process because it creates a 'virtual building' that everyone can visualise enabling those who wouldn't normally understand architectural plans to provide input on the design.

One of the biggest projects on the table is the AU\$1.7bn redevelopment of the Royal Adelaide Hospital in South Australia which, according to Mungo Smith from UK-based MAAP Architects, will be the "greenest hospital in Australia". The design concept put together by MAAP and a local firm of architects also allows flexibility for future refits. Several lift cores mean that one can be refitted without compromising the internal arrangements of the hospital. And all of the diagnostic and recovery

areas have external walls – again, to facilitate redevelopment with minimal disruption. Green space is built right into the hospital by providing a view to the outside or to a courtyard from all points in the hospital. Subspecialties are vertically stacked next to the specialties on each floor, providing easy access both on that floor and from other departments. The project is funded through a public-private partnership (PPP) and is expected to go to tender later this year. Completion is due in 2014.

## Austin-Mercy hospital campus

The redevelopment of the Austin Hospital site brought two hospitals together on one site in northeastern Melbourne – the refurbished 400-bed Austin Hospital and the 1190-bed Mercy Hospital for Women which was relocated from east Melbourne. Designed by Silver Thomas Hanley and Jackson Architecture, the aim was to create an integrated hospital campus that provided patient-focused care, maximised external views and ensured good wayfinding and access to views. Aluminium-clad façades and use of simple palettes of stone, timber, glass, terrazzo and stainless steel helped give a fresh and contemporary feel to the two towers. Extensive energy modelling also resulted in a design that is expected to reduce energy consumption by 15-25% compared to similar sized facilities, says Silver Thomas Hanley. The project was completed in 2005.



**Southland Base Hospital**

Project completion date: 2004  
 Client: Southland District Health Board  
 Architect: Jasmx, McConnel Smith Johnson  
 Cost: NZ\$55m



**In resource-rich states, PPP tends to be used less or not at all**

PPP funding is one of three methods used to fund the development of healthcare facilities in the country and is mainly used for large projects such as the Royal Adelaide. There are currently two other major PPP projects in planning – the AU\$1.55m Gold Coast University Hospital in Queensland and a new cancer centre in Melbourne. The 750-bed Gold Coast Hospital, designed by a consortium of SilverThomas Hanley, Hassell and Powell Dodds Thorpe, will replace the existing hospital and has been designed with easy wayfinding, targeted at the significant population of retired people who live in the area. "No one has to walk more than 60 metres to get where they're going," says Aija Thomas, principal director at Silver Thomas Hanley.

Another PPP project currently under construction is the Royal Children's Hospital, also in Melbourne, which was featured in the July 2008 issue of *World Health Design*.

For the most part, smaller projects are government funded using procurement processes such as design and build lump sum tenders. In resource-rich states, PPP tends to be used less or not at all. In Western Australia, the AU\$1.76bn Fiona Stanley Hospital, due for completion in 2013, will be funded completely through state funding. Designed by a consortium of Silver Thomas Hanley, Hassell and Hames Sharley, the 643-bed tertiary hospital will be the state's flagship hospital. Construction is due to start in mid-2009, with completion scheduled for 2013.

When the intensive care unit at the Alfred Hospital in Melbourne first opened in August 2000, it was found to have a high level of *Aspergillus*, which can be life-threatening for patients with a compromised immune system, in its ceiling and wall structure. The redevelopment of the unit, designed by Billard Leece Partnership and completed in November 2008, aimed to prevent outside air containing the fungus from passing through the building fabric and bypassing the air-handling systems.

A 100% outside air system was installed with heat recovery using run-around coils to recover heating/cooling off the exhaust air – both an

economical and clean option, according to Arup which developed the solution for the unit. HEPA filtration was used to reduce the potential concentration of *Aspergillus* and other infectious spores. The facility was served by two interconnected air heating units which maintained a positively pressurised envelope through the use of venturi air valves, catering for the local fluctuating wind pressures and the effects of changing air pressure during emergency helicopter activity.

The use of roof lanterns provided natural light for bed bays and glass, that could be switched from transparent to opaque, replaced curtains between beds in order to improve infection control and patient wellbeing. Central nursing stations each had large roof lights with switchable glass in order to provide natural lighting while minimising glare for patients.

Taking advantage of the natural surroundings is also a feature of many new facilities. The Royal Children's Hospital in Melbourne, designed by Bates Smart and Billard Leece, with HKS, has been built to integrate with the adjacent parkland. And the new Bates Smart-designed mental health facility in Dandenong, on the eastern edge of the city, incorporates 15 courtyards and uses landscaping to facilitate navigation around the building. "As you make your way to a bedroom, it feels like you are going outside," explains Bates Smart director Kristen Whittle. "There is a real indoor/outdoor connection." The building is clad in timber, providing warmth and tactility to create a more humane space.

Another consideration, particularly for healthcare facilities located in regional and remote locations is the requirements of the indigenous population. The aboriginal and Torres Strait Islander population need access to views of nature, space in which to congregate with members of their clan and areas where they can get together separately from other clans, according to Ian Moon from McConnel Smith & Johnson (MSJ).

In addition, there are particular healthcare issues, such as tuberculosis and co-morbidity, that need to be catered for. MSJ has just started putting together a masterplan for a new hospital in Cairns, north Queensland to meet these needs.



Royal Children's Hospital in Melbourne takes advantage of local parkland in its design



Office of Aboriginal and Torres Strait Islander Health (OATSIH) health facility at Yalata, South Australia

Arup has also been working on a range of facilities for the Office of Aboriginal and Torres Strait Islander Health (OATSIH).

**Across the Tasman**

It is a similar scenario across the Tasman Sea in New Zealand, where hospitals around the country are being redeveloped and brought up to date. The country has a federal healthcare system with 21 district health boards who have responsibility for the management of hospitals and healthcare provision within their area. Most treatment in public hospitals is free for residents. There is also a system of private hospitals, mainly restricted to elective and day surgery.

As in Australia, there was a burst of construction in the country during the 1970s which slowed down in the 1980s and 1990s. According to Marko den Breems from Jasmx, New Zealand's

largest firm in the healthcare sector, a lot of knowledge was lost during that time and it is only just beginning to be built up again – and many health boards and architectural firms, including Jasmx, team up with Australian partners for health planning for projects.

Funding for new hospitals, or the redevelopment of old hospitals, is usually provided by the district health boards and, at least currently, PPP funding is not used. And the New Zealand Ministry of Health has endorsed the *Australasian Health Facility Guidelines*.