CHRISTCHURCH WOMEN’S HOSPITAL

The proposed building practitioners’ licences will relate to the complexity of buildings worked on. The highest category, three, covers large or special-use buildings, such as hospitals. You can see why when looking at Christchurch’s new Women’s Hospital and the complex challenges met by the team putting it together.

By David Killick, journalist, Christchurch

By the turn of the new millennium it had become increasingly obvious that the 1950s women’s hospital in Christchurch had reached its use-by date. ‘The building was no longer suitable for modern health services and the fabric had serious ongoing maintenance issues,’ the Canterbury District Health Board (CDHB) concluded. Frequent transfer of staff, patients and support services, including blood and tissue samples, between sites was required, leading to increased cost and delays.

But building a new hospital on the present Christchurch Public Hospital campus would be a huge undertaking. The hospital is arguably one of the most complex buildings to be constructed in New Zealand in recent years. Design, engineering, construction, and project management all posed formidable challenges. The hospital cost $78 million, and the project – from concept plan to completion...
– took five years. More than 300 people were actively involved: hospital management, architects, engineers, specialist consultants and teams of construction workers.

The hospital is a 10-level building, including two levels underground on a site that slopes back towards the rear of the building. The logistics involved were akin to a full-scale military operation. That the hospital opened in May 2005, on time and within budget, is testament to good management and cooperation within and between organisations. General manager Pauline Clark attributes its success to consultation from the outset, with three-way discussions among clinicians, the CDHB site redevelopment team, led by Bryan Spinks, and the architects.

How did it all come together?

Christchurch Women's Hospital followed a logical, but highly involved series of steps. Just like in a military campaign, a chain of command was set up with clearly defined lines of responsibility. Figure 1 illustrates how the various roles interlinked.

After the budget was determined and approved by the Ministry of Health, the design phase began in May 2001. Project architect Darryl Carey, of Chow:Hill Architects, says the CDHB took a very traditional approach when engaging the architect. ‘We were the lead consultant, architects, project managers and health planners for the project, rather than these roles being split to separate consultants. We had to take a detailed brief from a number of user groups. On any one week during the design stages we would have anywhere between six to 12 briefing meetings with a team of architects working hard in between to keep design progressing.’

The design encompassed several special aspects that affected the construction process. The main one was the use of base isolators. Structural engineers Holmes Consulting were responsible for their installation. Also used on some bridges, critical buildings and major infrastructure, base isolators act like giant shock absorbers, allowing the hospital to move 420 mm in each direction in the event of a major earthquake. Because the building contains all the elements of a hospital, such as X-ray rooms and operating theatres, it was designed to function in a post-disaster scenario. ‘The rest of Christchurch Hospital could be severely damaged by a serious quake, but the Women's Hospital would continue to operate in a crisis mode,’ said Carey.

An enriching, healthy environment

One of the main design challenges was to integrate health planning and architecture to produce a building that sits well in its special environment and is not just a functional box.
It was also important to ensure the building was attractive.

Interior design was another priority. ‘A women’s hospital should be an enriching, life-giving, healthy environment – a celebration of women and health in a community,’ writes Chow:Hill. The concept of ‘celebrating women’ was developed with the client to underpin design of the hospital interior. Māori concepts of health, or wairua, often manifest in the presence of water, or wai, as an expression of mauri, or life force, were incorporated. Birthing units include the use of birthing pools and comfortable easy chairs for partners – the antithesis of a cold clinical environment.

But complex, diverse construction

Concrete is used extensively, with some 8,000 m³ under the ground. Pre-cast concrete ‘billboard’ panels, sunshades, and double-glazing units with solar-control glass were used. The structural frame is reinforced concrete with pre-cast beams and columns, cast in situ mid-span joints, and pre-cast flooring units with timber infill and concrete topping to floors. Shear load is resisted by the exterior structure and by structural steel K-braces at the lift core.

Hydraulics, electrical, data, medical gases and other services for operating theatres and delivery suites had to be considered. Site manager Bill Hewat, of Hawkins Construction, described the project as daunting. ‘I have been doing this for 35 years – 20-storey buildings, a lot of commercial buildings. This was the most complicated job I have ever worked on. It was huge.’

Reasons included the amount of services needed, and the diversity of internal spaces. ‘The sheer complexity of it, and the timeframe, and the quality that had to maintained, and the fact that we were working in a live environment next to and joined on to the existing Christchurch Hospital, a 24/7 acute hospital – all were factors. Airborne dust was a concern – construction debris can in some cases be fatal.’

Noise was a problem. The construction site is also next to the historic Nurses Memorial Chapel. If a wedding was going on, the team would have to stop.

Consultation was ongoing, with checks and balances throughout design and construction and handover. Each month progress reports were made. Participants included the CDHB, project managers, an independent programmer, quantity surveyors, structural, hydraulic, mechanical and electrical engineers, independent consultants, and the architecture team. Fortunately, the Hagley Hostel meeting room, the site office and the CDHB office were all on hospital premises.

With huge achievements

CDHB site redevelopment staff had a huge role, especially Bryan Spinks and Antony Manners. ‘They both had a really close, detailed and hands-on involvement in the project, much more than the average client, and still do,’ said Carey. He believes, in retrospect, the design process could have been streamlined. A lot of time was spent with users, tailoring the building to their specific requirements.

Engineer Wayne Lawson was the professional project manager, and Paul Sutton also performed a vital role as clerk of works. ‘They were our eyes and ears on site,’ says Carey. ‘They were there every day. If there was a concrete pour at 3 a.m. Paul would turn up, working closely with Hawkins just to see things were done the right way.’

Site manager Bill Hewat would liaise with everyone. Each floor had its own foreman, running their own team, consisting of a leading hand, and a team of carpenters and labourers. There was also an army of independent subcontractors. Hawkins used a project management program to track progress on the myriad tasks, big and small, and faced a penalty of $10,000 a day if the hospital was not complete by the due date.

‘Reaction to the design has been almost universally positive – the hospital has been adopted by the community,’ says general manager Pauline Clark. ‘It has been especially rewarding to see our design objectives being achieved and, in many cases, exceeded, both functionally and in the quality of the environment. We now have a facility that assists and inspires us to improve every day.’

Bill Hewat, of Hawkins Construction, was site manager for the hospital. (Photo by David Killick.)

The hospital under construction. (Photo courtesy of Hawkins Construction.)