

GREEN HOSPITAL A HEALTHIER CHOICE

A commitment to environmentally sustainable design by this Pathfinder project – Hamilton’s new green hospital – has resulted in a healthier hospital and potential for significant operational and maintenance savings over the life of the building.

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Braemar Hospital Ltd has been a healthcare provider in Hamilton since 1924. In building a new hospital, they were committed to key quality attributes: location, orientation, planning, a high level of services and quality finishes. The hospital had to meet the needs of surgeons, staff and patients.

Commitment to sustainability

A carefully considered strategic development plan was drawn up. With the help of architects Chow Hill, it was decided to consolidate the existing hospital on one site adjacent to Waikato Hospital and to build with an environmentally sustainable design (ESD) focus. The location reinforced their commitment towards sustainability from social and environmental

perspectives as it starts to form a health precinct in the Hamilton area and provides easy access to staff, patients and visitors.

Criteria for building set at start

As sustainable design is a term open to interpretation, it was important to establish relevant criteria to enable the team to meet performance targets. At the start of the design process, Chow Hill approached David Fullbrook from e-Cubed Workshop for guidance in developing suitable criteria for the building.

This move was key as, by the time a design is completed, 80–90% of a project’s life cycle economic and environmental costs are already inevitable. More importantly, when just 1% of the hospital’s upfront costs are spent, up to 70% of

its life cycle costs may already be committed. By preparing a parametric 3D model of the whole building, e-Cubed provided options, each with a cost-benefit analysis, to enable the client to make informed decisions on their path towards sustainability. As services played such a crucial role, this was developed in close consultation with Mark Preston, Beca’s building services design manager.

Complex project used prototypes

It was important that the contractor could deliver the level of quality and meet the sustainable targets demanded by the client. Initial selection was based on non-price attributes. From this, three contractors were shortlisted to tender for the project. Mainzeal was successful, and as part of their bid, they committed to the on-site waste management plan – a first for a large construction project in Hamilton.

During construction, a deluxe bedroom suite and an operating theatre were mocked up to help both the client and the team understand the complex arrangements, services and scale of the spaces. All team members found this to be a worthwhile exercise and would recommend it for future projects of this complexity.

Green initiatives bring pay-back

Not all green measures cost extra money, but items such as solar water heating, high efficiency lighting, optimal insulation and efficient chillers and boilers require additional investment upfront. Based on the developed design cost-benefit analysis, the additional cost investment in the sustainable design features selected was estimated as \$444,000, with a 6.5 year pay-back. This offered potential to achieve considerable savings for the client, considering

Project	Braemar Hospital
Client	Braemar Hospital Ltd (Paul Bennett, CEO)
Architect	Chow Hill Architects Ltd (Richard Hill, architect and design manager)
Building services	Beca (Mark Preston, building services design manager)
ESD specialists	e-Cubed Building Workshop (David Fullbrook)
Contractor	Mainzeal (Allan Scott, construction manager)
Region	Hamilton
Sector	Healthcare
Construction value	\$26.5 million
Preliminary design	Completed March 2007
Tender stage	September 2007
Start of construction	November 2007
Completion of majority of work	14 April 2009
Form of contract	NZIA SCC1 with special conditions

that hospitals are generally refurbished on a 20 year basis.

Establishing a desired energy use target

Establishing a desired energy use target of <math> < 300 \text{ kWh/m}^2/\text{year}</math>, compared with the 360 kWh/m²/year average New Zealand hospital, meant that Braemar could also realise a 20% operating cost saving. This is difficult to achieve. Hospitals need to operate 24 hours a day, 7 days a week, with services running continuously to meet stringent health requirements.

The project is currently being assessed during the 12 month building maintenance period, but energy modelling so far indicates that they are on target. A sophisticated building management system enables continuous fine-tuning of energy use.

Making a good job better

To meet the ESD targets, the sustainable features had to stack up. The building design focuses on wellness. Daylight into the interior is maximised through the use of rooflights and internal courtyards, and there are windows in the operating theatres. Healthy materials were selected: all carpets have environmental choice labels, low VOC paints were used and finishing timbers and veneers were sustainably sourced.

The contract documents required a commissioning regime with O&M manuals, and e-Cubed provided independent commissioning advice. Mainzeal are currently on site and are monitoring the services. Maintaining key team members throughout the project has been particularly useful and has ensured a focus on finishing and making a good job better.

Success down to leadership and seeking advice

The client sought advice throughout each step of the project. They showed strong leadership and clearly articulated their vision and needs. This helped the project team meet their objectives and kept the costs transparent. The key project team had experience in designing or building hospitals, vital in light of the tight timeframe.

Enhancing the spatial qualities within a

building make it a healthier place to occupy, but it also has the potential to offer significant savings for the client in the operational and maintenance life of the building. Going green

is a win/win for this project, benefitting the environment, the users and the client.

A more detailed report is available at www.constructing.co.nz, see Pathfinder projects. ◀



Hamilton's new green hospital during construction.



The completed Braemar Hospital, Hamilton (Photo courtesy of Chow Hill). See also page 45 photo.