Commentary: Green buildings

Lynn Eaton

The new wing at Lewisham Hospital looks set to be a shining example of environmentally friendly building. The trust's medical director Robin Stott¹ and senior managers were committed to sustainability and wanted to use the most energy efficient methods, incorporate materials that could be recycled at the end of the building's planned 30 year life, and give something back to the local community. It's an indicator of Dr Stott's green credentials that he became rather tetchy when I suggested driving over to see the building site, saying he would prefer me to use public transport.

The new 419 bed block is crammed into the existing hospital site, between the main road and small Ravensbourne river. The seven storey building (eight if you include the plant room on the roof) cleverly follows the curves of the river. There is a small park on the other bank, which would take the bulk of any flood water should the levels ever rise too high. The first floor of the building is about 5 metres above the height of the river, reducing the effect of any potential flooding. The building began in July 2004 and the hospital is due to open in November 2006, at a cost of £58m (€85m, \$109m).

Recyclable materials

Reducing unnecessary waste isn't just about energy management. Outside, the walls have been clad with terracotta blocks and aluminium panels, both of them recyclable at the end of the building's life. Inside, the flooring is vinyl, which is again recyclable. The suppliers even collect large off-cuts from the existing

building and recycle those. The main contractor, Carillion, has a contract for rubbish skips from the site to be sorted so relevant materials can be recycled while the rest is dumped as waste.

Wherever possible the building relies on natural air flow rather than air conditioning. The ground floor has swing doors that will create air flow into the reception area. But the theatres on this and other floors will each have their own air cooling system. This is essential to provide as sterile conditions as possible and to reduce the risk of cross contamination.

Bill McGill, now director of redevelopment at Great Ormond Street Hospital, was project director of the Lewisham site when the build began. No one needed to convince him of the importance of building an ecologically sound hospital. "I originally did my masters degree in energy management," he explains. "But there were a couple of key people at Lewisham—the chief executive, finance officer, and having a design champion like Robin Stott was absolutely vital."

But they could get too enthusiastic. "I had to temper the chief executive at times, who was looking at low energy domestic buildings that were totally inappropriate for a hospital. You can't have low air change, for example. You are trying to get rid of smells and people mingling."

Taking shape

The stroke unit is already starting to resemble a recognisable ward, with a nurses' island and individual rooms with en suite facilities you'd normally expect in

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Catching the rays: Solar panels on the roof of the new hospital in Lewisham

a private hospital. The windows, which are all double glazed, have a large lower pane which opens only a short distance at waist height, but above them smaller windows open fully, allowing natural ventilation without any risk of a patient falling through them. The only air conditioning will be in the central corridor and nurses' island, which do not have windows.

The timber used in the doorframes comes from sustainable sources and the doors are wood veneer on MDF (medium density fibreboard), much less wasteful of wood than solid doors and a lot cheaper. And the building tries to avoid ledges and corners where dust and dirt might collect, using rounded, curved fittings instead. All this, explains Mr Cannon, the design manager, helps reduce the cleaning problems and the risk of cross infection.

Up on the roof, the plant room houses the units that draw air from outside, filter it, push it round the hospital, and expel it. A climb up a ship-style ladder reveals the pièce de résistance: 24 blocks of solar panels, sitting like stacked dominoes about to fall, their faces towards the sun. Once the building is open, there will be a panel in reception showing how much of the building's energy they generate.

"Don't get too excited—it's actually going to be fairly low," warns Mr McGill, who admits the panels were really just the icing on the cake. "The real saving will be in the naturally ventilated building, although one of the great things was that the government met 60% of the cost of installing them." It's estimated that the solar energy panels will provide 10 640 kWh a year, equivalent to a saving of about £458 on standard electricity supplies.

Community links

But Mr McGill is keen to emphasise that the building was about more than just energy efficiency. "We wanted to integrate it with the local community," he said.

Other NHS examples

Rutland Lodge Medical Centre in Leeds was opened in April 2005. The general practitioners bought the site, in Chapel Allerton, from the council. Practice manager Helen White says they wanted to use sustainable products wherever possible. "But we had to use plastic piping for some of the areas as we dispose of urine samples." They also wanted to avoid using air conditioning. "There are windows everywhere," she said. But the biggest advantage is having adequate space to work.

Bronllys Hospital in Powys became the first hospital in the UK to generate power from sunlight in June 2005. It used 14 local people to install the photovoltaic solar panels (which directly generate electricity). The hospital is south facing and perfectly oriented for catching as much power from the sun as possible. The panels are expected to generate around 45 500 kWh/year. The installation cost was £547 586. For more health related case studies visit www.sd-commission.org.uk/pages/progressinpractice.html.

Following consultation with local residents, they decided to integrate the new hospital block more closely with the park on the opposite side of the river. They moved an existing bridge so it was easier to cross directly from one side to the other and secured a £1m European Union grant for this and other work to the park. They also wanted to use local companies to provide food for the on-site canteen.

And his advice to those considering similar sustainable developments? "You need a few key people at the top who are quite single minded to make it work."

Competing interests: None declared.

1 Stott R. Healthy response to climate change. *BMJ* 2006;332:1385-7.

A good surgeon should know when to abandon a procedure

In my early days as a consultant I saw a patient with left upper abdominal pain and a lump in the loin. Abdominal ultrasonography in the 38 year old widow revealed a grossly hydronephrotic left kidney and a right pelvic kidney. An intravenous urogram showed some functioning renal tissue in the region of the upper sacrum corresponding to the pelvic kidney. The left kidney was not visualised. An isotope renogram displayed tracer uptake in the region of the upper sacrum but no activity in the left renal area.

The pain from the dilated, non-functioning left kidney was interfering with her job as a tea plucker, and so she wanted it to be removed. I was reluctant to do the operation straight away as she had only a little renal tissue in her pelvic kidney and her serum creatinine concentration was already slightly raised. However, she was adamant—understandably, since her stay away from work was a serious financial loss.

On opening the patient, I found a very large hydronephrotic kidney extending to the pelvis. The decompressed kidney revealed paper-thin parenchyma except in the lower pole. For a moment, I wondered whether this could be the little functioning

renal tissue that was shown in the isotope renogram as a pelvic kidney, and I considered whether to leave the hydronephrotic kidney behind.

Then I thought it would be amateurish to seem uncertain and abandon the nephrectomy in front of the junior doctors and the nurses. I did not want to be a cowardly surgeon who would have to tell the patient that I had left the diseased kidney because I was not sure. I therefore removed the kidney.

Postoperatively, the patient was anuric, and her serum creatinine continued to rise, necessitating haemodialysis. A few hours after the second session of haemodialysis, she developed a severe bout of haematemesis and melaena and died.

As a surgeon, one should never feel cowardly in abandoning a procedure when there is a doubt or an unexpected difficulty. This is true for any intervention. A living problem is always better than a dead certainty.

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