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A Healthy Obsession with Sick Buildings

The relationship between the broad environmental movement and green building design has come full circle in the last 50 years, returning to the idea that a building's materials are central to any argument about sustainability – 'healthy materials' leading to 'healthy buildings'. But what happens when green ideology gets in the way?

Text Tone Wheeler

Previously, in AR 111, I argued that green design rests on four pillars, nicknamed after Aristotle's basic elements: fire, water, earth and air – or, in architectural terms, energy, water, materials and footprint. The shorthand is 'lifecycle', which describes and analyses the impact of every stage of materials, from creation to use to recycling or eventual destruction. Concerns start with resources, as construction materials have been responsible for some of the big environmental issues: deforestation, mining, river gravel, sand depletion and loss of biodiversity. Next come manufacturing concerns, either high-energy use (glass and bricks) or potential pollution (asbestos, cement) – or both (steel, aluminium). Energy is an issue in transport and waste is a critical factor in installation.

The three Rs – repair, reuse and recycle – have become the mantra for sustainable use, but more recently, concerns about 'outgassing' – harmful, volatile organic compounds (VOCs) produced during manufacture that carry into the building's life – have become critical. VOCs are found in glues, paints and compound materials, and in the cold climates of Europe and the US, researchers testing the internal environmental quality (IEQ) of highly sealed and 'weatherised' buildings discovered alarmingly high levels of pollution, often exceeding external levels. The solution lay in two directions: better ventilation, using natural ventilation or 'one-pass' fresh air systems, and better materials.

The value of green materials was first observed in 'green offices', particularly the first LEED 'green star' buildings in the US. Originally, green design propaganda mostly promoted the

idea of return on investment through savings in energy (and water use, to a lesser extent), but the really big savings came from increased efficiencies in staff costs. Due to 'healthier' interiors, productivity went up and absenteeism went down, as did staff churn. However, the results were sometimes so dramatic that other problems arose such as 'presenteeism', in which sick staff, who should have taken time off to avoid infecting others, continued to go to work, believing the office to be better for recuperation than the home.

The change in emphasis from external form to IEQ can be seen across a range of building types. Possibilities for improvements in children's health as a result of lower VOCs are now influencing material choices in residential design, while the Olympics has provided a grander stage for green materials. Sydney 2000's widespread use of solar panels, energy efficiency and water conservation was accompanied by an emphasis on material changes, particularly the elimination of PVC. The remediation of a former industrial area is currently paralleled in London, where its bid to host the 2012 Olympic Games was successful partly on the promise they would 'reduce, reuse and recycle', becoming the 'greenest Games the world has ever seen'.⁽¹⁾

The rise in considerations of healthy materials has led to greater emphasis on the tools used to validate green building design. Green Star is the Green Building Council of Australia's analysis tool for an increasing array of building types (not just offices), and its material concerns are 25 per cent of the considerations – healthy materials play a big part in scoring points. In response, the highly

acclaimed Ecospecifier tool accredits a wide range of materials and lists outgassing and other health considerations, certified through the Green Tag system. Other tools, however, such as Good Environmental Choice, have been criticised for being too reliant on support from the industries they promote, or for lacking the rigours of independent assessment, or both. What constitutes 'real green' leads to volatile debates about 'greenwashing'.

The central figure in this argument is architect William McDonough, co-author with chemist Michael Baumgarten of *Cradle to Cradle: Remaking the Way We Make Things*, the seminal book from 2002 that sought to 'transform human industry through ecologically intelligent design'. Printed on recyclable plastic, not paper, as a demonstration of its arguments, *Cradle to Cradle* transformed the debate with its comprehensive analysis of lifecycles and an emphasis on pollution and health issues. Subsequently McDonough has undertaken demonstration projects in the US and China, establishing a system for certification of materials. But it has not been plain sailing, and McDonough has been criticised on a number of fronts, summarised in a recent article in *Fast Company* magazine.⁽²⁾ Nevertheless, he remains the key, albeit controversial figure in American sustainable design.

At 2011's Dwell on Design conference in Los Angeles, McDonough was the keynote speaker. Speaking eloquently and passionately, his arguments appeared based on sensible scientific logic, but just when a bright, new green future seemed the logical outcome, he cruelled his pitch with an extreme position on one particular product: carpet. In the past it has been

notorious as a product subject to great churn in buildings, leading to considerable waste, but more recently it has been a 'good news story' centring on the use of recyclable floor tiles, because they allow changes in part or whole of the floor, which is even better if the old tiles can be reused or remade. The company leading this innovation is Interface Flor, founded by Ray Anderson, who set out to make the greenest carpeting possible, becoming a notable spokesperson for sustainability in business along the way.⁽³⁾ A worldwide company, with a factory in Picton NSW, Interface Flor has developed ways in which their old tiles can be completely recycled into new ones, both backing and face,⁽⁴⁾ rather than downcycled (McDonough's term) into a lower-grade product – for instance where bricks and tiles are crushed into gravel because they cannot be fully recycled into new bricks.

In his address, McDonough was highly critical of the chemicals used in the remaking of carpet tiles by others, in turn lauding one of his own *Cradle to Cradle*-endorsed products. Using the platform to promote one product, his own, while savaging another with considerable green advantages seems not only self-serving and hypocritical, but also severely dilutes the very cause he espouses. Rather than presenting a rational explanation of scientific facts, his approach was more akin to a southern Baptist preacher, with the audience playing along as adoring throng, worshipping their saviour and demagogue! To outsiders, however, it seemed a minor squabble, like asking which laneway is best when the whole of the city is up for consideration.

Rather than minor spats about who is greenest, it would seem that in a highly polluted world, every advance in specification of building materials, whether lifecycle or health impact, needs to be celebrated. What seems even more critical now is to address the fourth pillar: footprint. As in the London Olympics example, better materials is certainly trumped by less or no materials at all. **ar**

NOTES

(01) Karen Kissane, 'River reborn as Olympics rise from a field of green dreams', *Sydney Morning Herald*, 26 December 2011.

(02) Danielle Sacks, 'Green Guru Gone Wrong', *Fast Company*, November 2008.

(03) As in the film *The Corporation*, where Anderson discusses sustainability in business.

(04) Interface Flor has been active in Australia for over 15 years, having taken over and redeveloped the Heuga carpet tile factory in Picton NSW in the 1970s and upgrading it to their standards of recycling. This represents a stalwart of Australian manufacturing that has not been outsourced to China.