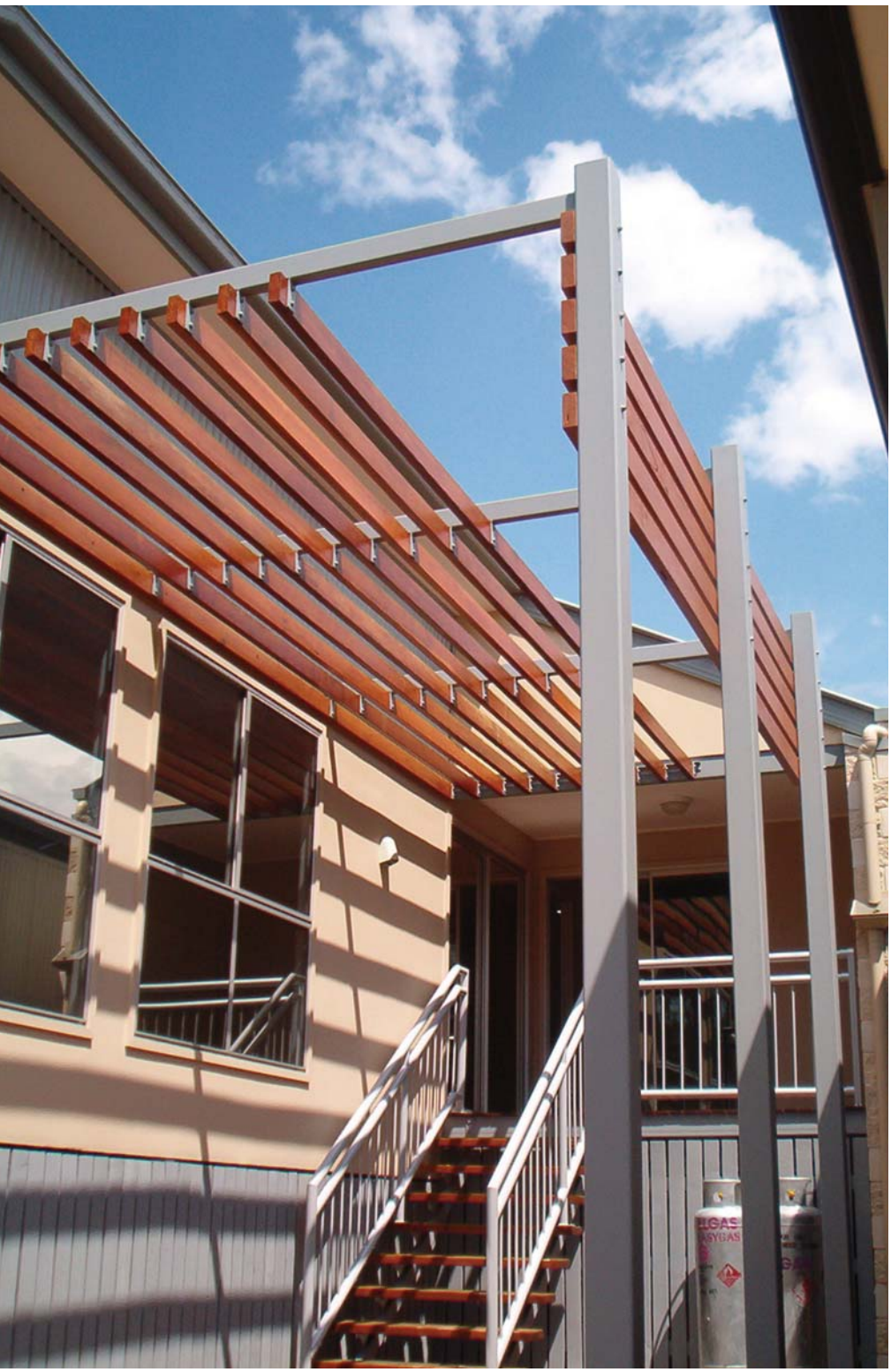
Research

Dr Keith Hampson – CEO, CRC for Construction Innovation

Orientation, orientation, orientation

Cooling Queensland's suburbs



As building regulations raise the bar even higher in order to have our homes constructed more sustainably, builders are placed under increasing pressure to understand the complex interactions between subdivision design and building design. At the Cooperative Research Centre (CRC) for *Construction Innovation, the Sustainable Subdivisions Project* is examining subdivisions in south east Queensland to help builders meet regulations, stay competitive and make our new suburbs more energy efficient and comfortable places to live.

Industry interviews

To gain an insight into the current state-of-play in the design of residential subdivisions, the project team interviewed individuals involved in subdivision development.

The survey found that yield (as determined by topography, zoning, site location, allotment size, density, orientation, competition and landscaping) was clearly the bottom line when configuring allotments.

Nevertheless, proactive developers indicated their interest in subdividing so as to provide more sustainable allotments to aid builders in achieving sustainable dwellings.

However, they identified a range of barriers that may obstruct progress towards this, including difficulties with defining and measuring sustainability, resistance to changing from traditional practices, outdated regulations, valuers not adequately assessing sustainable factors, issues relating to consumer demand and knowledge and the lack of industry rewards, incentives and an integrated/collaborative approach to achieving sustainability.

Orienting for efficiency

The Australian CRC for *Construction Innovation's Sustainable Subdivisions Project* examined a range of contemporary dwelling designs, both detached and attached to explore the link between subdivision design and dwelling design. All were modelled as if located in Brookwater, an outer suburban greenfield development in Brisbane's southwest or Kelvin Grove Urban Village, a brownfield development in inner suburban Brisbane.

The results showed that orientation plays a key role in energy efficiency. Appropriate orientation will capture natural light, breezes for cross-flow ventilation and solar access for energy.

The study provided data to confirm the notion that in Queensland, orientation for solar access although important, is not as pertinent as in southern states, and that natural ventilation plays a significant role in the overall energy performance.

It also established that both slab-on ground and elevated dwellings could perform well in terms

of energy efficiency if they were appropriately designed.

Project Leader Michael Ambrose of CSIRO says it's in the developer's favour if a subdivision provides potential for buildings to be oriented in a way that will enhance their ability to meet regulations for sustainability. Narrow lots should be north/south orientated, while wider lots can be east/west orientated and still allow enough setback for good building orientation.

"In such a competitive market and with increasing sustainability regulations, builders will need to identify those building lots that may cause design problems and require significant modification and resulting cost increases to meet regulations.

"It's far better that the builder starts with a block that has good potential from a sustainability point of view."

While the current 3.5 star rating for residential construction in south east Queensland can usually be met without considering subdivision orientation, a higher rating is likely to be introduced and this will require new tools and methods in both subdivision and construction. Developer and builders will need to work more closely to achieve these higher standards.

According to Dayan Jayasekera, Project Manager of Springfield Land Corporation, the Brookwater JV is committed to helping builders and purchasers arrive at cost effective and sustainable solutions to building at Brookwater, while at the same time taking on the stewardship of looking after the environment for generations to come. Their partnership with the *Sustainable Subdivisions Project* will help them meet that commitment.

Saving energy

This project also highlights how tremendous savings are to be made by the use of energy efficient appliances and reducing the need for air conditioning.

The installation of air conditioning systems in Queensland continues to rise, putting continued pressure on the state's electricity production.

"This is in part a reflection of the inappropriate design and orientation of many new dwellings that have not taken sustainability factors into consideration. Unfortunately orientation is often given low priority during the development process," Michael Ambrose says.

Construction Innovation CEO, Dr Keith Hampson sees sustainability as key to both the construction industry and the agenda of this CRC servicing Australia's property and construction industry.

"This project was the first part in what is planned to be a series exploring a broad range of sustainability issues facing new subdivisions. By working closely with our partners, priorities are being determined that enable us to target this research to meet industry needs. The important practical outcomes generated by the project will be shared with industry through publications and seminars," he says.

Construction Innovation industry, government and research partners collaborating on the *Sustainable Subdivisions - Energy Efficient Design Project* are: Brookwater JV, DEM, Queensland Department of Public Works, Queensland University of Technology and CSIRO.

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