Water handling is key to success in green urban area

The Groves estate near Merndain, Victoria, is redefining water-sensitive urban design, writes **Pete Heininger**.

GLENN HUNT

Water works

- Bonacci valued conventional stormwater design for the estate at $557,000, $49,000 less than its final water-sensitive version.
- However, once stormwater offsets were applied, the final design costs were around $400,000, less than others.
- The Groves is regarded as a benchmark for future water-sensitive urban estate design.

A 77-hectare residential estate on Melbourne's northern fringe looks set to revolutionise the way we design — and cost — green, water-saving developments.

Already some four years in the making, The Groves estate, near Mernda, is challenging conventional wisdom that going "green" will ultimately cost more while delivering little physical difference compared with business-as-usual urban sprawl.

The site was recently acquired by Babcock & Brown Residential Land Partners from Elderslie Property Developments and Clough Land Developments.

Courtesy of an integrated water-sensitive urban design that has considered a raft of cascading effects from each allotment — and across the entire region — planners have modelled cost cuts of 28 per cent on planning the first stage of the $62.5 million greenfields development.

In the process, they have planned to reshape the landscape, potentially allowing for more saleable land. This planning will also ensure that eventual stormwater runoff from the 800-900 lot site will have little more impact than it did before development began.

According to consulting engineers, The Bonacci Group, initial higher planning costs will be more than offset by reduced landscaping and infrastructure costs coupled with generous stormwater offsets provided by Melbourne Water.

Bonacci valued conventional final water-sensitive urban design. However, once stormwater offsets of slightly more than $200,000 were applied, the final water-sensitive design costs came in at slightly more than $400,000. Using modelling developed by Dr Peter Coombes and the University of Newcastle, the Bonacci Group plans to use The Groves estate as a benchmark for future water-sensitive urban estate design and to help develop standards for similar residential developments throughout Australia.

Software used for this modelling has been jointly developed by the university and the Co-Operative Research Centre for Catchment Hydrology, which ceased operating in 2005.

According to Coombes and Bonacci director, Geoff Foster, developers have to stop thinking purely in terms of initial cost when considering green estates and "dry" buildings. They have to consider longer-term value propositions, in which each aspect of a development — including longer-term infrastructure and maintenance costs — are considered.

"Part of this value proposition is the additional premium those wanting to buy into developments like this are prepared to pay," Coombes says. "We are already seeing premiums up to 30 per cent above conventional developments being paid for green and "dry" developments in Melbourne."

Benchmarking at The Groves could take another five years, Foster Melbourne Water.

The first 100 allotments have already been developed, and the estate will eventually include a school and limited commercial development.

The Groves has been designed from the ground up to be different. Although the estate will carry a mix of housing styles, 3000-litre rainwater tanks, water-efficient appliances, toilets and showerheads have been mandated throughout.

These changes have allowed the

'Developers have to stop thinking in terms of initial cost when considering green estates.'

developers to reshape the way water moves and will be used throughout the estate, substantially affecting overall design and cutting construction and infrastructure costs.

Mains water consumption will be 45 per cent less than on conventional developments, and stormwater runoff will be cut 65 per cent. Wastewater will be cut 24 per cent.

The overall quality of stormwater runoff is also planned to rise, with

Instead of traditional wetlands, The Groves will incorporate bio-retention swales, small sediment basis, contour banks and so-called rain gardens.

The Bonacci Group has forecast peak stormwater runoff will be cut 67 to 89 per cent, while annual stormwater runoff will be cut almost 80 per cent.

"Our modelling also shows that peak day water demand will drop 20 per cent, while instantaneous water demand will fall more than 50 per cent," Foster says. "Annual mains water demand across The Groves will be cut almost 11 megalitres."

Tanked rainwater will enable householders to flush toilets and water gardens without drawing heavily on mains water, creating further, long-term savings. The lower overall impact of stormwater and its improved quality will also add to these savings — for the estate and broader community.

Less stormwater runoff will allow for smaller stormwater infrastructure and associated lower maintenance costs.

"Almost all other requirements will be reduced compared with similar-sized conventional estates," Foster says. "These will include smaller water mains and lighter distribution infrastructure, and smaller downstream water management infrastructure.

"Each of these elements will help lower costs compared with those of conventional estates."

Foster and Coombes say that with these savings already built into the model, the longer-term appeal of building on estates like The Groves can only strengthen — especially if or when mains water and sewerage treatment charges, and power charges rise to offset environmental impact.

Ironically, though, The Groves is surrounded by a number of conventional estates, designed and built around conventional wetlands, and conventional mains water, sewerage and stormwater infrastructure.

"However, once The Groves has been monitored and we can use that performance data to develop regional-wide, water-sensitive urban design standards, we should start to see wholesale changes to everything from household water use through to infrastructure design," Foster says. "This will help generate enormous savings across the board, and can only