

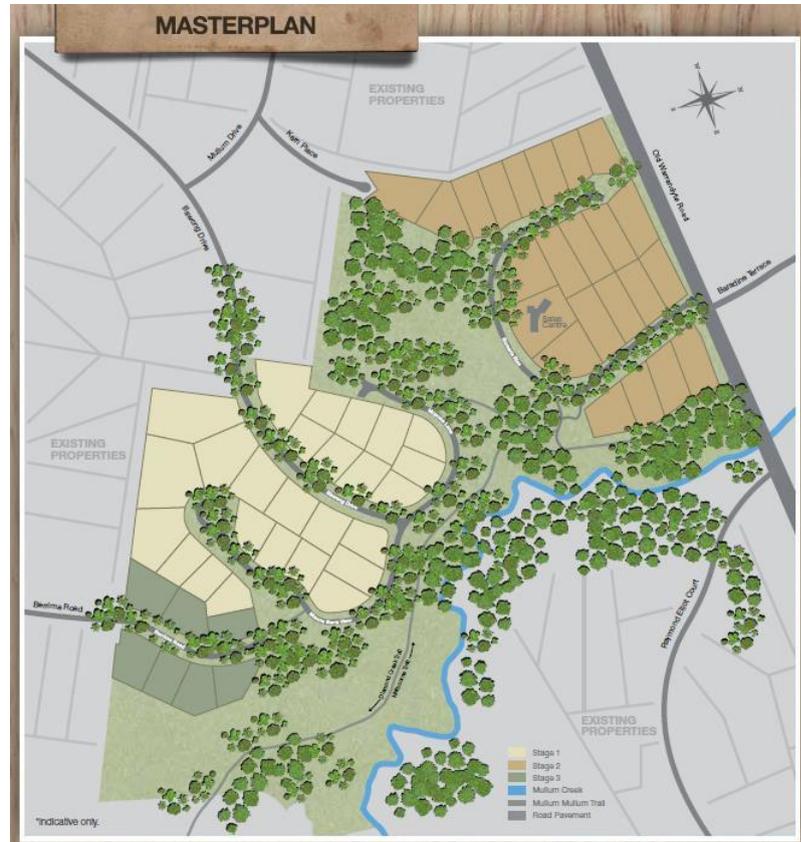
## UDIA Sustainable Urban Development Matrix

This case study has been prepared for the [UDIA Sustainable Urban Development \(SUD\) Matrix](#). The SUD Matrix aims to promote and facilitate social, economic, and environmentally sustainable urban development initiatives. All cases are reviewed by the [UDIA Sustainability Committee](#) prior to uploading and periodically to ensure the SUD Matrix remains current

PROJECT NAME:	<b>MULLUM CREEK – INNOVATIVE SUBDIVISION AND DESIGN GUIDELINES TO ADDRESS SUSTAINABILITY</b>
PROJECT OVERVIEW:	<p>The Mullum Creek estate is located along the western bank of the Mullum Mullum Creek in Donvale, approximately 20 km from the city of Melbourne. The site was formerly a mixture of farmland and remnant bush. It has been owned by a single family since 1958 and is now being developed in an environmentally sensitive manner. Home sites are confined to previously cleared land, and the creek frontage and remnant bushland (approximately 45% of the original property) will become a reserve to be managed by Manningham City Council (<b>Council</b>). The Mullum Mullum Linear Park and Bike Trail will extend along the creek, and the bush will continue to provide habitat for a wide variety of indigenous animals and plants.</p> <p>The site has a total area of 20ha. It will be subdivided in to 56 lots, ranging in area between 1,120m<sup>2</sup> and 3,484m<sup>2</sup>. The average lot size is 1,535 m<sup>2</sup>.</p> <p>The development of the Mullum Creek estate is under-pinned by a clear vision and design intent. The vision is as follows:</p> <p><i>“Mullum Creek is a sustainable development in which residents will live in homes that have a light environmental footprint. They will be energy efficient, incorporating solar power and water conservation, and will minimise the use of non-renewable resources. Good design principles and responsible building practices are central to the vision.</i></p> <p><i>The key elements of the Mullum Creek Vision are:</i></p> <ul style="list-style-type: none"> <li>▪ <i>Respect for the existing environment and topography, reflected in the siting of buildings and works;</i></li> <li>▪ <i>Environmental sustainability, reflected in energy efficiency and conservation of resources to minimise environmental impacts;</i></li> <li>▪ <i>Design excellence, reflected in buildings that are of a scale and style compatible with the landscape character and setting of the Mullum Mullum valley; and</i></li> <li>▪ <i>Longevity, reflected in design that is adaptable to future uses and a changing climate.”</i></li> </ul> <p>The project involves subdivision works, construction of roads, provision of utility services and infrastructure, and master-planned landscaping incorporating wetlands and extensive reserves to protect and enhance the local flora and fauna.</p> <p>Lot prices within Stage 1 of the development range between \$650,000 and \$1,180,000. Mullum Creek purchasers are seeking a more sustainable way of life in a setting with rural appeal that provides the convenience of suburban living.</p> <p>The project required an amendment to the Manningham Planning Scheme to enable lots smaller than 0.4ha to be created. The smaller lots enabled the development to be focused on parts of the site which were less environmentally sensitive, and to provide a reserve along the banks of the</p>

Mullum Mullum Creek.

The Mullum Creek development has received EnviroDevelopment accreditation for all six leaves.



Mullum Creek Masterplan (Taylor Cullity Lethlean)

CORE AREA OF SUSTAINABILITY ADDRESSED BY THIS CASE STUDY:

Subdivision and Building Design.  
Energy.  
Water.  
Life Cycle Assessment (LCA).

OBJECTIVES OF THE PROJECT RELEVANT TO CORE AREA:

- Provide residents with knowledge and tools to reduce the ecological footprint of their activities.
- To reduce the amount of greenhouse gas emissions from both the construction and operational stages of the development.
- To minimise consumption of potable town water.
- To incorporate products and processes that minimise consumption of materials.
- To substantially reduce the total amount of energy used by households compared to the average Victorian’s household energy (on a per capita basis).
- To ensure that landscape and urban design outcomes support energy efficiency of buildings and solar access to buildings and private open space.

IMPLEMENTATION MEASURES/ KEY

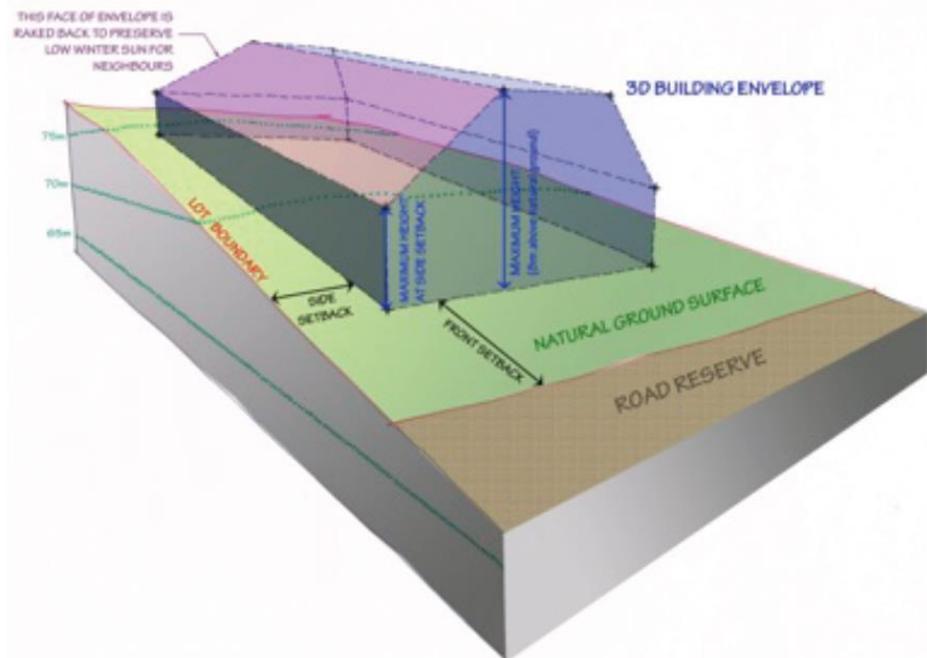
The Mullum Creek development includes a range of sustainability initiatives. This case study does not highlight all of them, but focuses on those which are

INNOVATIONS:

most significant:

### 3D Building Envelopes

The subdivision design was accompanied by detailed analysis of each lot that incorporated elements such as vegetation to be retained, solar access, the dwelling's height and position on the site, and how this took into account the height and location of dwellings on adjoining lots.



Building Envelope Schematic (Paul Haar Architect)

This will lead to dwellings being constructed that not only have good solar access to living areas, both indoor and out, but that also protect their neighbour's solar access.

### 7.5 Star Energy Ratings

Dwellings within Mullum Creek are required to achieve a minimum energy rating of 7.5 stars, whereas the current building regulations only require 6 stars. Star ratings are based on the amount of heating and cooling energy that will be required. While a 6 star rating represents 125MJ/m<sup>2</sup> (Moorabbin climate zone), an increase to 7.5 stars reduces this to only 75MJ/m<sup>2</sup>, a 40% reduction.

### On-Site Water Collection and Re-use

Dwellings are required to include 20,000L of rainwater storage, collecting water from at least 80% of the roof surfaces, and connecting, at a minimum, to toilets, the laundry trough, and any garden irrigation system. This will significantly reduce demand from potable water supplies, and also assist in reducing negative impacts on Mullum Mullum Creek due to increased stormwater runoff because of the increase in hard surfaces on the site.

### Sustainable Design Guidelines

Many subdivision developments have guidelines to influence built form

	<p>outcomes. However, with respect to ESD, most guidelines only recommend or suggest various measures. The Mullum Creek guidelines take a further step, containing detailed ESD requirements in relation to:</p> <ul style="list-style-type: none"> <li>• 3D Building envelopes;</li> <li>• 7.5 star energy ratings;</li> <li>• Concrete with reduced Portland cement content;</li> <li>• Reducing use of steel;</li> <li>• Timber (Eco-certified, recycled, etc.);</li> <li>• Roofing (Low embodied energy);</li> <li>• Bulk insulation (Eco-certified);</li> <li>• Low VOC paints;</li> <li>• Passive solar design (Natural cross ventilation, sun control, shading);</li> <li>• Water efficiency standards for fixtures and fittings;</li> <li>• Minimum of 4kW of photovoltaic panels;</li> <li>• 40% of site to be landscaped to reduce heat island effect;</li> <li>• Construction waste management;</li> <li>• 20,000L water tank connected to toilets, laundry trough and irrigation system(if provided); and</li> <li>• Indigenous vegetation protection and planting.</li> </ul> <p>Importantly, the ESD requirements are fully integrated with the approval and checking process that applies for all other design requirements. This is administered through a Design Review Committee who must approve a dwelling design prior to it being granted building approval.</p> <p><u>Mullum Creek Design and ESD Incentives Package</u> Mullum Pty Ltd has assembled a package valued at \$15,000 to provide purchasers with sustainable design (building and landscape) schemes and advice, expert energy rating, and life cycle assessment to guide the development of house designs.</p>
<p>LESSONS LEARNED:</p>	<p>Overall, the tailoring of ESD initiatives to a project needs to be considered very carefully. The developer learned that communication with prospective purchasers would be critical to the success or otherwise of the project’s sustainability initiatives. If requirements are considered to be too onerous, then potential purchasers may be reluctant to commit. If there is too much scope for purchasers to avoid the implementation of ESD initiatives, then the overall project objectives could be significantly compromised. The costs and benefits of individual initiatives needs to be assessed and outcomes communicated to potential purchasers. To address this, Mullum Pty Ltd assigned a representative to communicate with prospective purchasers about the sustainability requirements; to explain their implications and the benefits and costs.</p> <p><u>Subdivision and Building Design</u> The joint consideration of lot boundaries, house locations, slope, orientation, dwelling heights and vegetation proved to be a complex technical undertaking. While good outcomes for solar access, visual amenity, and overshadowing will result, to achieve this takes a substantial amount of time and effort.</p>

	<p><u>Energy and Water</u> Setting in place requirements that extend beyond regulation and standard practice did not prove to be overly complex. The important consideration was that clear expectations needed to be established for land purchasers, and that these needed to be achievable. Where appropriate, performance based requirements were set, so that house designers could retain flexibility for their design response.</p> <p><u>Life Cycle Assessment</u> Consideration was given to requiring LCA as part of the design assessment process, and setting life cycle impacts. However, due to cost and lack of market recognition, this was not pursued. Instead, the developer has offered LCA as part of an incentives package to increase its use and familiarity, and to educate designers and purchasers of the benefits of thinking about the long-term impacts of design decisions.</p>
OUTCOMES/ RESULTS:	The project is still in the early stages, with physical construction of subdivision infrastructure yet to commence (as at September, 2014). However, sales have been strong with over 85% of Stage 1 sold out.
WEBSITE:	Case Studies: <a href="http://www.udiawa.com.au/go/Sustainable-Urban-Development">http://www.udiawa.com.au/go/Sustainable-Urban-Development</a> Mullum Creek Project: <a href="http://www.mullumcreek.com.au">www.mullumcreek.com.au</a>
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