

Rosehill Waters

Land use / development type	Scale
Residential development	Precinct
Commercial development	Precinct
Public open space	Precinct

Stormwater controls	Scale
Living streams	Precinct
Retention of native vegetation	Precinct & Street
Raingardens	Street
Bioretention areas	Street
Soakwells	Lot

Efficient use of water	Scale
Waterwise landscaping	Precinct & Street
Efficient water fixtures	Lot
Community bore	Precinct

Site conditions	
Soils	Clay & sands
Groundwater	< 5 m

Local government	Location
City of Swan	West Parade, South Guildford

The Rosehill Waters residential development is situated along the Helena River in South Guildford. A key focus of the 47 hectare (ha) development is sustainable development and living. It comprises 624 dwellings over 41.4 ha with 5.6 ha dedicated to public open space, including a connection to the Helena River foreshore.

Through the focus on environmentally sustainable development, a number of water sensitive urban design elements have been incorporated at the lot, street and precinct scales.

Individual homes have been built with WELS 3 star-rated water fixtures and gardens use a combination of hard and soft-landscaping, hydroplanting, and a selection of low water use

native species is provided. Irrigation water for all residential and public gardens will be supplied through a community bore service provided by Total Eden. Accordingly, no scheme water will be used for irrigation in Rosehill Waters. This will reduce scheme water use in the development by at least 40%. Usage will be monitored and managed to ensure compliance with an existing (and reduced) groundwater licence allocation.

Raingardens have been incorporated into the road reserves and bioretention areas are located throughout the open space for water quality treatment. The water quality treatment areas contain plants selected for their nutrient removal capability as recommended in the *Vegetation Guidelines for stormwater biofilters in the south-west of Western Australia* (Monash University, 2014). These areas will treat the first 15 mm of road runoff, which generally contains the highest concentration of contaminants, before the water is discharged into living streams that will provide further treatment. Runoff will be conveyed into raingardens via overland flow and flush kerbing.

Living streams are a key water sensitive design element at Rosehill Waters. Existing linear, trapezoidal agricultural drains connecting upstream catchments to the Helena River were converted into meandering, revegetated living streams. A biophysical assessment and flora and fauna surveys identified that some sections of the drains had important hydrological, biological and ecological functions. The living stream retrofit design involved hydraulic and hydrological modelling to maintain post-development flows at pre-development flows, and to ensure

the streams are able to convey the 1% AEP rainfall event.

Key Project Features

- Rosehill awarded the Urban Development Institute of Australia's Enviro Development top six-leaf rating for excellence in sustainability.
- Community bore for residential and public irrigation will reduce scheme water use by 40%.
- Existing degraded agricultural drains converted into living streams which treat stormwater and convey up to a 1% AEP rainfall event.
- Living streams are integrated within public open space, with access points, lookouts, signage for community education and paths.
- Raingardens and water quality treatment areas improve water quality and infiltrate stormwater close to source.



The streams are designed to convey runoff within a two-staged channel to provide water quality treatment and ecological benefits. This includes a low-flow channel and safe conveyance of flood flows within a high-flow channel.

The streams include stabilised vegetated banks to reduce erosion and reflect a more natural waterway morphology compared to the pre-development linear drains.

The completed living streams are an important component of the public open space, with recreational values optimised through numerous public access points, paths and lookouts, as well as signage for community education.

Existing vegetation has been retained throughout the development where possible, including significant mature trees around the living streams. Where

vegetation is not present or needed to be cleared, new vegetation has been selected from a revegetation species list that was based on local vegetation types. This included regional complexes present in the area, as well as species used in nearby dampland vegetation rehabilitation programs. Species include *Baumea juncea*, *Carex tereticaulis*, *Juncus pallidus* and *Lepidosperma angustatum*.

Development Costs¹

Total stormwater costs	\$465,000
Community bore	\$675,000
Verge raingardens	\$1,200 each
Total landscaping, including living streams	\$1,350,000

¹All costs are site-specific and are an approximation for guidance purposes only

Issues

During construction of the living streams, high volumes of water in the drain meant that erosion and sediment control were a key challenge. Extensive erosion matting and sediment control fences were installed along the length of the living streams to prevent incoming sediments and bank erosion. In addition, firmly staked, weed-free straw bales and silt curtains within the stream flow were placed upstream of culverts to catch suspended sediment.

Outcomes

Rosehill Waters has become the first private development in Western Australia to be awarded a six-leaf accreditation under the Urban Development Institute of Australia's (UDIA) EnviroDevelopment system. EnviroDevelopment is a national rating tool that provides independent verification of a project's sustainability performance. The certification process is designed to assess project initiatives across six areas: ecosystems, waste, energy, materials, water and community.

The development was awarded the EnviroDevelopment Chairman's Choice award in the UDIA (WA) 2017 Awards for Excellence and the Stormwater WA 2018 award for Master Planning. Rosehill Waters has been recognised as a Waterwise development by the Water Corporation, due to the use of water sensitive urban design and the commitment to saving water in a drying climate.

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