

The Esplanade biofilter retrofit

Land use / development type	Scale
Residential Retrofitting	Street Street

Stormwater controls	Scale
Biofilters	Street

Efficient use of water	Scale
Waterwise landscaping	Street

Site conditions	
Soils	Sand

Local government	Location
City of Melville	Brentwood

Running along the Canning River in Brentwood, The Esplanade road reserve provides a significant opportunity to better manage stormwater runoff prior to it entering the ecologically sensitive river.



The City of Melville has undertaken a verge renewal project with a key objective to retain and treat stormwater, which also incorporates waterwise landscaping into the residential streetscape between the Mt Henry Bridge and Pulo Road.

The design, developed by the City of Melville, incorporates biofilter garden beds between the road and pedestrian footpath, which

treat and infiltrate stormwater runoff from the road.

Biofilter beds were excavated to a depth of 200mm and filled with native soil/sand mixed with TerraCottem® to aid the establishment of plants.

Local native species were selected to increase survival rates, reduce irrigation needs, increase habitat and create a natural aesthetic. After planting, biofilter beds were topped with 100mm of gravel or 75mm of quartz sand to aid in stormwater filtration.



Where roadside car bays are incorporated into the verge, the biofilter beds are interspersed with poured limestone paths to allow pedestrian access to the footpath without disturbing the vegetation.

The edges of the larger beds have been battered with laterite spalls to prevent scouring from large stormwater runoff events, as well as creating visually engaging paths for rivulets of water to enter the beds.

The road has been graded towards the verge to direct stormwater runoff to the biofilter beds.

Renewal works were completed in November 2016.



Key Project Features

- Road retrofit project.
- Stormwater runoff retention and filtration through coarse substrate to recharge the groundwater.
- Removal of pollutants (e.g. sediment, hydrocarbons and heavy metals) from road runoff through biofilter media and native vegetation to protect the adjacent Canning River.
- Native, waterwise landscaping utilised along the roadside that provides habitat, enhances biodiversity and reflects natural landscape character.
- Creation of green infrastructure within a residential landscape to reduce urban temperatures and support recreation and community wellbeing.

Development Costs¹

Biofilter landscaping incl plants, media/soil & mulch	\$ 75/m ²
Kerbing and concrete works	\$ 210 /lineal m
Drainage works	\$ 177,000

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



Issues

One of the keys to the success of this project was the City's civil engineers, landscape architects and civil construction team worked together to deliver a project that meets multiple objectives. This included recognising the competing objectives of plant survival (which requires soil moisture retention) and good drainage (which requires rapid infiltration), and working towards solutions that optimised the overall outcome.

Other issues to solve included ensuring safe pedestrian access and sufficient barriers for vehicles.

Outcomes

This project delivered 600m of road retrofit that incorporates 360 lineal metres of biofilters, with a surface area of 470m², providing a mechanism for stormwater treatment prior to discharge into the Canning River.

The renewal project demonstrates how to retrofit water sensitive urban design principles into an existing stormwater system in a residential streetscape. By successfully managing and treating stormwater runoff from The Esplanade, the new swale and biofilter provides protection to the adjacent Canning River from stormwater pollution.

The response from local residents has been largely positive (with some minor complaints about the inclusion of trees in the design due to viewlines to the river) and the City recognises the improvement in streetscape and amenity. It is also possible that the system may be cheaper to maintain, given the occasional truck watering during the height of summer compared to routine litter trap clearing and the remedial measures required to address pollution and erosion of the river.



Contact details for further information

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Images courtesy of the City of Melville