

The Grove: Leading, Learning, Living

Land use / development type	Scale
Commercial Retrofitting	Lot Lot

Stormwater controls	Scale
Dry / ephemeral defention area	Precinct & lot
Litter and sediment traps	Precinct & lot
Biofilter	Precinct & lot
Non structural strategies - education	Structure plan area & precinct

Efficient use of water	Scale
Waterwise landscaping	Lot
Water efficient fixtures and fittings	Lot

Water reuse	Scale
Managed aquifer recharge	Structure plan area
Green walls	Lot
Greywater reuse	Lot
Blackwater reuse	Lot
Rainwater storage and reuse	Lot
Stormwater harvesting and reuse	Precinct

Local government	Location
Shire of Peppermint Grove	1 Leake Street, Peppermint Grove

The Town of Cottesloe, Town of Mosman Park and the Shire of Peppermint Grove have worked collaboratively to develop a high-profile environmentally sensitive demonstration project. – The Grove: Leading Learning, Living.

Not only does the building target water efficiency, but it also serves as a 'living' educational tool.

Scheme water use at The Grove has been reduced significantly. Rainwater is captured, stored and treated for in-house use onsite. Waterless urinals and a number of low / limited flow water fixtures and fittings have also been installed at The Grove. Wastewater is captured, treated, and used onsite for irrigation. During the hotter months, some water is diverted to the thermal maze to aid cooling of the building.

Historically, stormwater flows from the 20 ha catchment were not treated. Now, primary treatment occurs through a gross pollutant trap prior to entering a pump-out tank. Secondary treatment sees the stormwater being pumped to a number of subsurface flow sedgebeds which utilise native plants to remove of nutrients, suspended solids, biological oxygen demand and heavy metals. The flows then drain into the vegetated ephemeral wetland where treated flows are recharged to the local aquifer.

Landscaping consists of a range of low water use, habitat comprised of Western Australian plant species. Green walls have been constructed around parts of the building which reduce the overall temperature of the building.

Key Project Features

- 💧 Grey water, yellow water and brown water is separated at each of the source points to optimise efficiency of wastewater treatment
- 💧 Potable and non-potable use of harvested rainwater
- 💧 Waterless urinals and many low flow water fixtures and fittings
- 💧 Stormwater quality improved prior to infiltration into the local aquifer
- 💧 Environmentally focused community education and engagement program
- 💧 Ephemeral wetland with local vegetation provides habitat and treats stormwater flows
- 💧 Green walls reduce heat island effect
- 💧 Habitat provided using waterwise landscaping



Image courtesy of The Grove

Development Costs¹

Rainwater harvesting system	\$494,400
Wastewater treatment and reuse system	\$320,300
Waterless urinals	\$1,100
Water efficient fixtures and fittings	\$5,600
Urine separating toilets	\$21,400
Thermal maze	\$427,600
Community education and engagement program	\$549,700
Green Walls	\$2,000 / m ²

¹Costs are site specific and are an approximation given for guidance purposes only



Image courtesy of The Grove Library

Outcomes

At the state level, the building is the first to incorporate yellow water diversion to an onsite wastewater treatment system. In the Perth metropolitan area it is the first public building which harvests rainwater for internal potable use (within a scheme water serviced area), treats wastewater onsite, and utilises groundwater and rainwater for heat exchange.

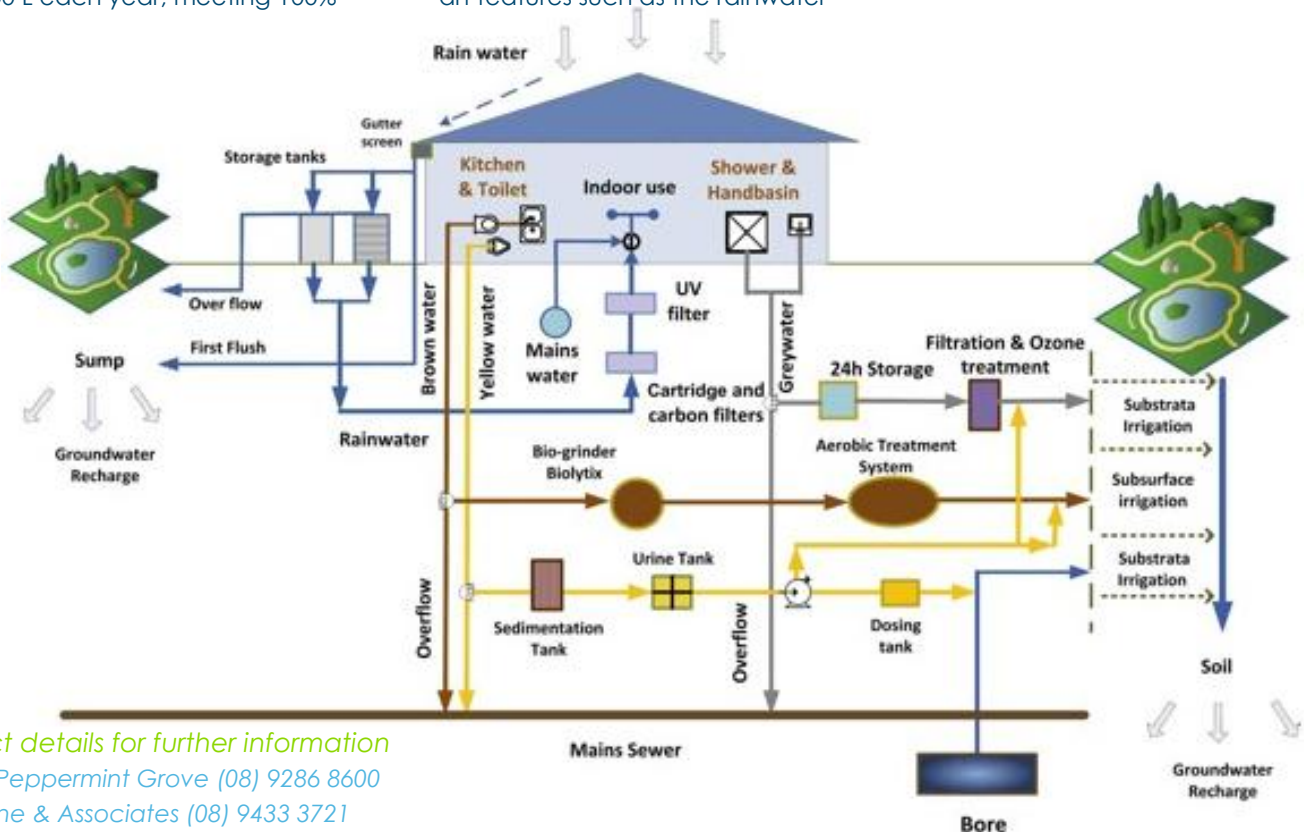
The 258 kL rainwater storage system is estimated to reduce the demand on the mains water supply by 730,000 L each year, meeting 100%

of the internal water demand. The water-efficient fixtures alone are estimated to save 175,000 L each year. Additionally, the draw on groundwater is expected to reduce by an estimated 700,000L through using onsite treated wastewater for irrigation purposes.

A large part of The Grove project is aimed at educating the community about ecologically sustainable development (ESD). The design of the building has incorporated 'viewing windows' to allow visitors to see the state-of-the-art features such as the rainwater

first flush chambers. User friendly interpretive signage, web-based material and fact sheets have been developed to aid community education about ESD. Community forums, workshops, events and activities which promote community understanding and enthusiasm towards ESD are also provided by the Grove Library.

A suite of detailed factsheets on the ESD features at The Grove are available from [The Grove Precinct website](http://TheGrovePrecinct.com.au).



Contact details for further information
 Shire of Peppermint Grove (08) 9286 8600
 Josh Byrne & Associates (08) 9433 3721

Image courtesy of Josh Byrne & Associates/ ETC Murdoch University



Government of Western Australia
 Department of Planning



Government of Western Australia
 Department of Water