

## Case study – Lightsview

*This is one of a series of case studies aimed at demonstrating the range of WSUD solutions being applied by practitioners in SA*



City View Boulevard

### Project planning & design

Creating a green, walkable suburb at Lightsview – applying the Heart Foundation's Healthy by Design Guidelines – required an affordable, climate-independent water resource to sustain the leafy streets and expansive park network. The Salisbury Water stormwater harvesting and managed aquifer recharge scheme provides an alternative water resource to this development that has enabled Lightsview to become arguably Adelaide's greenest infill suburb.

With a dwelling yield of 35 dwellings per hectare, Lightsview's gross housing density<sup>1</sup> (in the mid-range of the medium density development spectrum) is balanced by streetscapes and parks that will constitute 16% of the site at full development.

It is the streetscapes that currently sets Lightsview apart from other developments in Adelaide. Verges of generous proportions offer space for shared paths and deep soil zones that will allow street trees to reach their full height potential and canopy cover. The sustainable water supply has supported the establishment of a vast network of healthy street trees surrounded by grassy verges, mitigating the urban heat impacts to great effect.

The site, which was once CSIRO and South Australian Medical Research Institute grazing land and the former Ross Smith Secondary School, provided an opportunity to redevelop 100 hectares of land within 10 kilometres of the Adelaide CBD. While the largely undeveloped site afforded the design flexibility of a greenfield site, its location within the catchment has meant that the site also must cater for stormwater flows from upstream catchments. This has been addressed with an innovative approach to multi-functional public open spaces that puts people and place making as the overriding design criteria rather than more traditional approaches that offer a single objective flood management solution.

### Financial partners



### About the site

#### Organisation

Joint venture Renewal SA and PEET

#### Local Government area

City of Port Adelaide Enfield

#### Development type

Major infill development

#### WSUD feature type

- stormwater re-use
- wetlands
- bioretention systems

#### Total site area

100 hectares

#### Proportion of site public open space

15.7%

#### Total number of dwellings

3500 (at completion)

#### Date commenced

2008

#### Date completed

Ongoing (expected 2020)

### Annual benefits

- ✓ 84 ML p.a.<sup>2</sup> stormwater reuse
- ✓ 52 ML p.a.<sup>2</sup> stormwater reuse within 1,300 households
- ✓ 9 hectares of open space irrigated with 32 ML p.a.<sup>2</sup> stormwater

<sup>1</sup> As defined by Planning Strategy for Metropolitan Adelaide

<sup>2</sup> As at March 2018



*Waterford Circuit wetland*

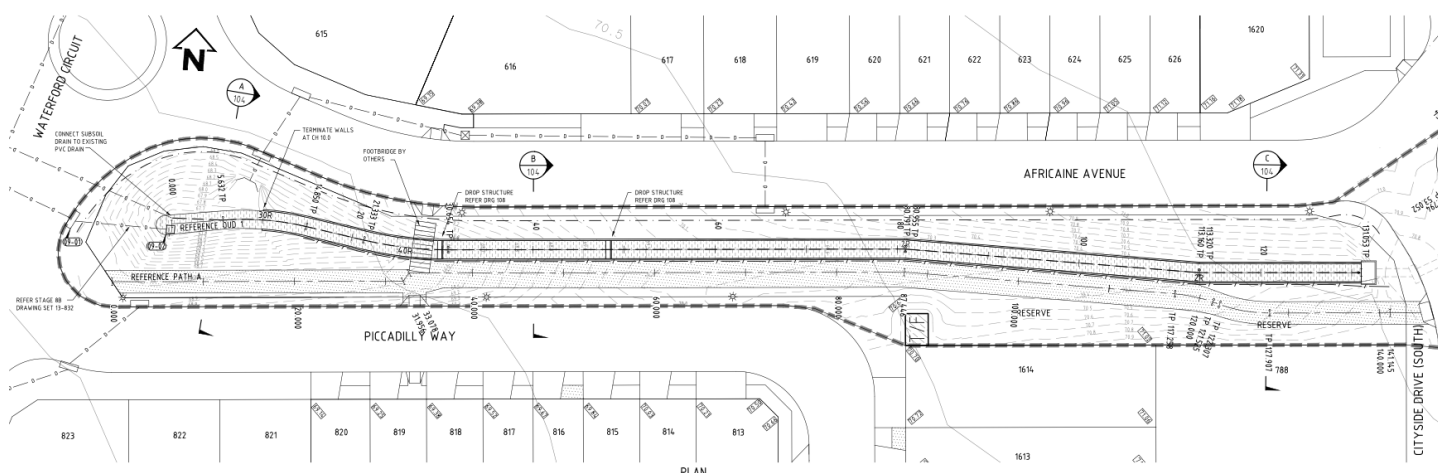
Stormwater quality treatment and passive reuse  
Stormwater from Stages, bounded by Fosters Road, Redward Avenue, East Parkway and Waterford Circuit, utilises a treatment train that includes swales, raingardens, detention basins and a wetland system.

The Africaine Avenue raingardens treat stormwater from the surrounding streets, addressing the change of gradient via a series of cascading weirs that transfer runoff from one raingarden bed to the next, stretching for more than 120 metres.

The raingardens terminate in a small detention basin prior to discharge to the Waterford Circuit wetland.

To maximise wetland retention times and improve water quality, the unconventional wetland system is designed with a sequence of baffles that make efficient use of the space available.

The system is designed to also cater for additional flows from catchments upstream of the development.



*Africaine Avenue stormwater treatment train design*



*Africaine Avenue, raingardens and detention basin*



*Africaine Avenue, raingarden*





East Parkway



Redward Avenue



Rapid Avenue (local street)



Waterford Circuit Reserve

## Stormwater re-use

Treated stormwater from the Salisbury Water managed aquifer recharge scheme is supplied to the site via, under third-party service provider Water Utilities Australia, who owns and manages the purple pipe water supply infrastructure.

A 180 mm diameter supply main was constructed from the Salisbury Water MAR scheme and wetlands located at South Terrace, Pooraka, and transfers treated stormwater to a one megalitre storage tank located under the tennis courts on Waterford Circuit, which ensures supply can meet demand over peak periods. Stored water is disinfected via chlorination prior to reticulation to homes and public green spaces throughout the development.

## Household use

Treated stormwater, or reWater as it is referred to by the developer, is piped to each household and plumbed internally to toilets and for outdoor uses, including garden irrigation and car washing. The reWater is supplied at a cost of \$3.12 per kilolitre plus an access charge of \$43.72 per annum (2017-18 prices). All households within the development are required to connect to the reWater scheme. This is comparable with SA Water rates (in 2017/18) of \$2.32/KL for the first 33kL per quarter and \$3.31/kL for subsequent use. Potable water is supplied to each household by SA Water.

## Open space and streetscapes

Once completed, the development will include 14.9 hectares of active and passive recreational spaces irrigated with reWater representing 15.7% of the total site area. No formal playing fields are proposed as they are all active green spaces, but not suitable for sporting clubs. In addition, there will be an indoor basketball stadium. To view the Lightsview reserve and streetscape network see [video](#) (1:50)

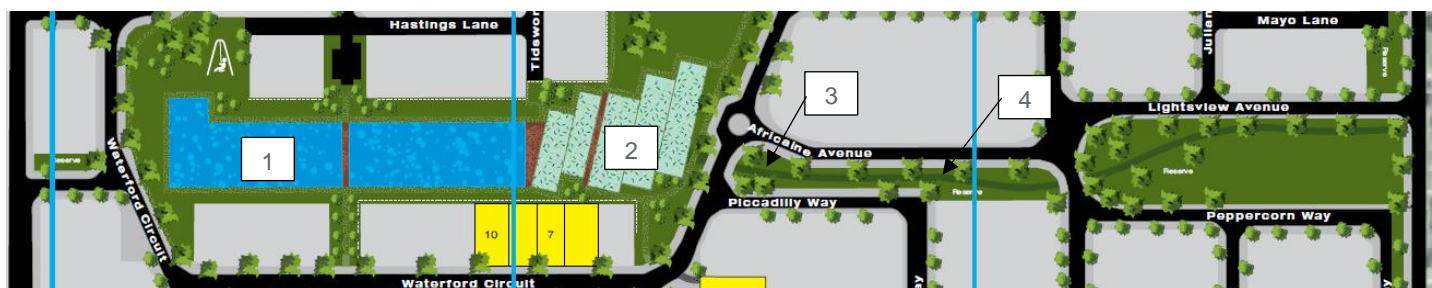
The limited private open space, in a housing mix of approximately 70:30 small lot terrace housing to detached dwellings, places even greater importance on the quality of the public realm, in particular the streetscapes. This was recognised in the master planning phase as verges across all categories of road within Lightsview are wider than industry standards. Each verge provides deep soil zones with the associated water holding capacity to enable street trees to flourish and with excellent prospect to reach their maximum height at maturity.

Road	Verge width (m)	Nature strip width (m)
East Parkway (major thoroughfare)	3-20 m	Varies along width depending on path hierarchy
Redward Avenue (entry/boundary road)	5 m	3.5 m
Rapid Avenue (local street)	5 m	3.5 m

The East Parkway effectively provides a linear park through the spine of the development, connecting with other significant green corridors provided by City View Boulevard and Waterford Circuit. All streetscapes feature healthy semi-mature trees and year-round vibrant green lawn areas, sustained by reWater. Residents irrigate street trees and nature strips adjacent to their property from the reWater supply line piped to the individual's property

### LEGEND

- |                                      |                                     |
|--------------------------------------|-------------------------------------|
| 1. Waterford Circuit ornamental lake | 3. Africaine Avenue detention basin |
| 2. Waterford Circuit wetland         | 4. Africaine Avenue raingardens     |



Africaine Avenue stormwater treatment train

## Flood management

The combined wetlands and ornamental lakes located along Waterford Circuit and East Parkway are an integral component of the flood management system for the site.

In a 1-in-100-year annual recurrence interval (ARI) or 1% annual exceedance probability (AEP) storm event, the lower level paths, retaining walls and grassed nature strip adjacent to the ornamental lake will become inundated.

The landscape design includes a second tier retaining wall that contains the extent of the design flood (see dashed red line in image below).

This design provides a multi-functional and adaptable public open space that provides the required flood protection for rare, yet significant, flood events without compromising quality and amenity values.



Waterford Circuit ornamental lake

## Challenges

Post storm event clean-up operations associated with flood waters that breach the low flow system throughout the Waterford Circuit lake and surrounds are expected to require greater effort than the clean out of a typical flood detention basin. Despite this, a design that favours the recreational and amenity needs of local residents over a single function flood basin is bold and offers the urban water management industry an alternative to conventional engineering approaches.

A successful and practical design outcome has also required the cooperation and partnership of the Port Adelaide Enfield Council who have been supportive of exploring and implementing a range of new practices and design outcomes.

## Disclaimer

Whilst every effort has been made to verify the accuracy of items in the Water Sensitive SA case study fact sheets, independent advice should be sought on matters of specific interest.

## Project delivery

### Stages 7-10, Civil design

- AECOM
- Greenhill Australia

### Stormwater treatment system design

- AECOM
- Greenhill Australia
- DesignFlow

### Landscape design

- Aspect
- Greenhill Australia

### Constructed by

- Catcon

### Case study contributors

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### For further information

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