WATER SENSITIVE SA

Mellissa Bradley, Program Manager

Urban Forests Masterclass Streetscape WSUD solutions

28 September 2016







LIVEABLE WATER SENSITIVE COMMUNITIES.



Water Sensitive SA - established to build the capacity of all organisations with a role in the planning, design, approval, construction or maintenance of new developments and infrastructure to implement best practice water sensitive urban design (WSUD)

Water Sensitive SA Program Partners





LOCAL GOVERNMENT RESEARCH & DEVELOPMENT SCHEME



Guiding Principles of WSUD



- Re-integrate water back into urban landscape – create microclimate
- Re-use of water at source (or close as possible)
- Protect receiving water quality (streams and marine)
- Fit for purpose water use
- Solutions at a range of scales



Unions Street Dulwich, B-Pods (infiltration systems)

Highlights package – streetscape solutions

Drawing upon:

Adoption guidelines for stormwater Biofiltration systems

CRC for Water Sensitive Cities.

Designing Streetscape Raingardens

DesignFlow.

Construction of WSUD Assets

Maintenance of WSUD Assets

DesignFlow.

- 1. Streetscape Solutions
- 2. Biofilters / raingardens
- 3. Raingardens and Trees





Angas Street, Adelaide adjacent SAPOL Photo: Water Sensitive SA

Deacon Ave, Mile End

RUADWORI

Lochiel Park, (SA)

C. States

Franklin Street. Image: City of Adelaide

Biofilters – Tree pits







Beachway Ave, Brooklyn Park

North Terrace Source: City of Adelaide

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Source: Designflow

www.watersensitivesa.com





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Filter media



Specification

Bioretention Technical Design Guidelines:

 References <u>Adoption Guidelines for Stormwater Biofiltration Systems</u>, CRC for Water Sensitive Cities

Key Requirements:

- Hydraulic conductivity of 100-300 mm/hr
- Some organics (3-5%)
- Some silts and clays allowed (<5%)

Source: Designflow

More information

Water Sensitive SA website

Raingarden 500 Grant Program





Source: Designflow

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Ah ha moments.....





www.ew.com

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Small systems – no overflow structure





Murchison Street, Mansfield Park

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Planting zones



Figure 1 – Raingarden zones for plant selection

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Figure 1 – Raingarden zones for plant selection

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Trees & Raingardens





Angas Street raingarden early and established, showing arrangement of filter media Images: Adelaide City Council and Water Sensitive SA

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Filter media depth - Trees





Source: Designflow

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Plant species proven to be effective at Nitrogen removal



	-		Zo	ne		C!	6	Height Preferred		
	Form	1	2a	2b	3	Species	Common name	(mm)	location	
1 Ann	۲	~	1			Carex appressa	Tall Sedge	1000	All	Less frost tolerant
	۲	1	1		5X 949	Carex tereticaulis	Rush Sedge	600-1200	All	Spiky
A				~	~	Goodenia ovata	Hop Goodenia	<mark>100</mark> 0-2500	All	Spreading shrub
	۲	~	~	~	~	Ficinia nodosa	Knobby Club-rush	500-1500	All	Formerly Isolepis nodosa
	۲	~	~			Juncus amabilis	Gentle Rush	600-1200	All	Less common juncus species in Adelaide region
			-							

Adapted from EPA Raingarden 500 guidelines

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Plant species proven to be effective at Nitrogen removal



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Adapted from EPA Raingarden 500 guidelines

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Plant species for companion planting



	Form		Zo	one		Species	Common name	Height (mm)	Preferred location	Comment
image		1	2a	2b	3					
	♥	1	1			Bolboschoenus caldwellii	Marsh Club Rush	300-1200	Often coastal	Spreading sedge
191 - 191 -	-		1	~	~	Crassula helmsii	Swamp Crassula	50	All	Spreading riparian herb, ground cover
A. S.	-		1	¥	1	Dichondra repens	Kidney weed	200	ILA	Spreading herb, ground cover
2 contraction	₩				~	Rannuculus lappaceus	Australian Buttercup	500	Adelaide Hills	
	₩		V	¥	1	Selliera radicans	Shiny Swamp-mat	50	ILA	Spreading riparian herb, turfy
	۷				1	Wahlenbergia stricta	Austral Bluebell	100-900	All	Spreading herb
		-								

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Randolph Ave, Streetscape Upgrade City of Unley





Bioretention – raingardens

- 10 raingardens of dimensions 1.70-2.10m wide x
 6.75-25.5m long)
- Total area 245m2 (0.5% of impervious contributing catchment)
- A saturated zone of 450mm depth to assist plant viability and storage capacity
- A design infiltration rate of 160mm/hr through filter media
- HDPE lined system with no exfiltration

Stormwater infiltration wells

Denotes raingarder

- 31 infiltration wells of dimensions 600x400x450 mm deep
- Waterproof membrane top and bottom with geofrabric and 20mm screenings around the perimeter, providing lateral infiltration to adjacent trees and garden beds.

Typical Raingarden Cross Section





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Raingardens and trees





Raingarden in full sun



Raingarden shaded to the west by mature tree

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Infiltration systems the hero



July 2015 - establishment



January 2016



September 2016

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Like to learn more?

A snapshot of the range of courses we offer



26	Maintenance of WSUD assets										
MAY IG	26 MAY - 8:30am to 4:15pm										
25	Construction of WSUD assets										
MAY 16	25 MAY - 8:30am to 4:30pm										
21	Leadership to advance water sensitive urban design										
MAR 16	21 MARCH - 8:30am to 22 MARCH - 5:00pm										
25	Detailed design of constructed stormwater treatment wetlands										
FEB 16	25 FEBRUARY - 9:00am to 4:30pm										
27	Designing streetscale raingardens										
AUG IS	27 AUGUST - 10:00am to 4:00pm										

Next courses – February/March 2017 Construction of WSUD Assets, Maintenance of WSUD assets

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Mellissa Bradley Program Manager

mellissa@watersensitivesa.com 0431 828 980

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