

ZAM-WSUD for Trees and the \$1 per Cleanout Gross Pollutant Trap

Towards Ultra-low Maintenance Stormwater Treatment as "Business as Usual"





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What is ZAM-WSUD?

"A Design Philosophy" "WSUD without additional maintenance requirements for asset owners"

ZAM-WSUD Research Project



Monash Water for Liveability Supported by Glen Eira Council

Water Sensitive Cities

Grassed

Grass is mowed by residents

Sediment collects in grooves and is removed by street sweeper

Grated entry prevents litter build up

Stormwater infiltrates through a 'clog resistant' filter media profile

High flows bypass to traditional drainage system





Clog Resistant Surface Layer



with 20/30 surface layer

FAWB spec only

Vegetated





Initiatives

LITER DY-

CRC for Water Sensitive Cities

- In-kerb sediment capture (removal by street sweeping)
- Clog resistant surface layer

 Surface layer is also weed resistant!!!

ISS

ZAM-WSUD Handbook



Zero Additional Maintenance Water Sensitive Urban Design

Handbook

Water Sensitive Urban Design without ongoing maintenance requirements for asset owners.



Search: Clearwater ZAM-WSUD

ZAM-WSUD Status

- Maintenance
- Treatment
- Cost
- Litter
- Council strategic priority
- Detention cost

ZAM-WSUD Status

- Maintenance
- Treatment



What About the Litter?



Very Low Maintenance Gross Pollutant Traps

Reduce emptying costs

- Standard GPT empty ~\$100's
- Automated bin empty ~\$1

Can emptying be automated?

Combined Bin and GPT





Manufactured in South Australia







ORC for Water Sensitive Cifies



Strategic Implementation

-> Target "Litter Hotspots"

ZAM-WSUD Status

- Maintenance
- Treatment
- Cost



Towards **ZAM-WSUD** as **'Business as** Usual'

ZAM-WSUD Integration

Issues faced:

- Rate capping is limiting "non-core" activities
- WSUD remains low priority
- Limited water quality "buy-in"

Flooding

Water Quality





"How can we avoid the water quality funding roadblock?"



Optimise WSUD solutions to maximise flood benefits

ZAM-WSUD Status

- Maintenance
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Council strategic priority
 Detention cost

ZAM-WSUD For Trees



Significantly more storage capacity available for treebased WSUD systems compared to non-tree systems





Quantifying the Benefits of Trees

Hydraulic Conductivity Increases:

2-140x Chandler & Chappell, 2008
27x Bartens et al., 2008
60x Bird et al, 2003

Better Understanding Tree Root Potential

"Micro-pipes"



Quantifying Hydraulics

Flow Rates:

-> Considerable variability

Evergreen conifers0.3-0.6mm/secLianas42mm/secEucalyptsHigh?MelaleucasHigh?

Lambers et alia, 1998

Local Hydraulic Redistribution Potential



Are we recognising redistribution potential in designs?

"Tree-Smart" Design Method



ZAM-WSUD For Trees

Multiple benefits

- Water quality
- Heat island reduction
- Tree drought tolerance
- Reduce flooding risks

Examples of **Tree-based** WSUD



Are Composting Pits ZAM?

CRC for Water Sensitive Cities

City of Mitcham, SA ->10 years maintenance free

Organics -> OK Gravels -> Minimise



Second Generation

Raised inlet

Stainless steel plate

Local depression

~\$600ea





Questions?





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THANKS AND GOOD LUCK!!!





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