

Water Sensitive Urban Design in Context



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for

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WSUD

- What is it?
- Key principles.
- How does it work?
- Does it work here?
- Does it work in other places too?

Water Sensitive Urban Design

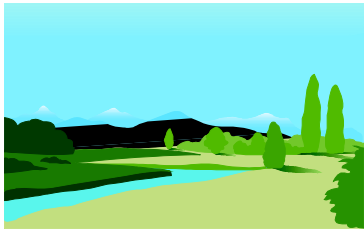
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graph TD; A[Water Sensitive Urban Design] --> B[ ]; A --> C[Stormwater + Urban Design];
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Stormwater +
Urban Design

A conceptual image featuring four human hands, two on the left and two on the right, positioned to hold a circular ring of water. The water ring is composed of multiple droplets and splashes, creating a textured, blue-white border. The hands are light-skinned and are shown from the wrist up, with fingers slightly curled as if supporting the ring. The background is plain white, and the entire scene is enclosed in a thin black rectangular border.

Water Saving
Techniques

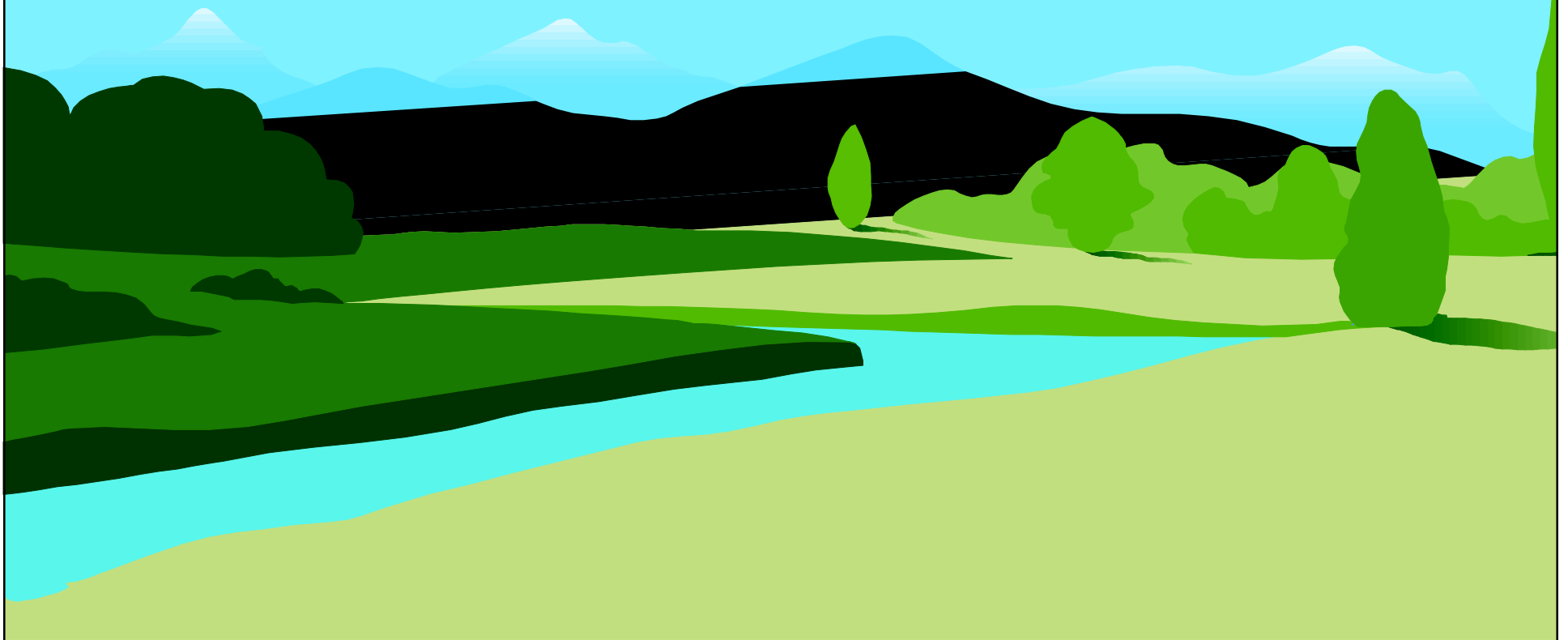
Key Principles of WSUD.



Adapted from: Urban Stormwater – Best Practice Environmental Management Guidelines

Key Principle 1

Protect natural systems.



Key Principle 2

Integrate Stormwater Treatment with Urban and Landscape Design.



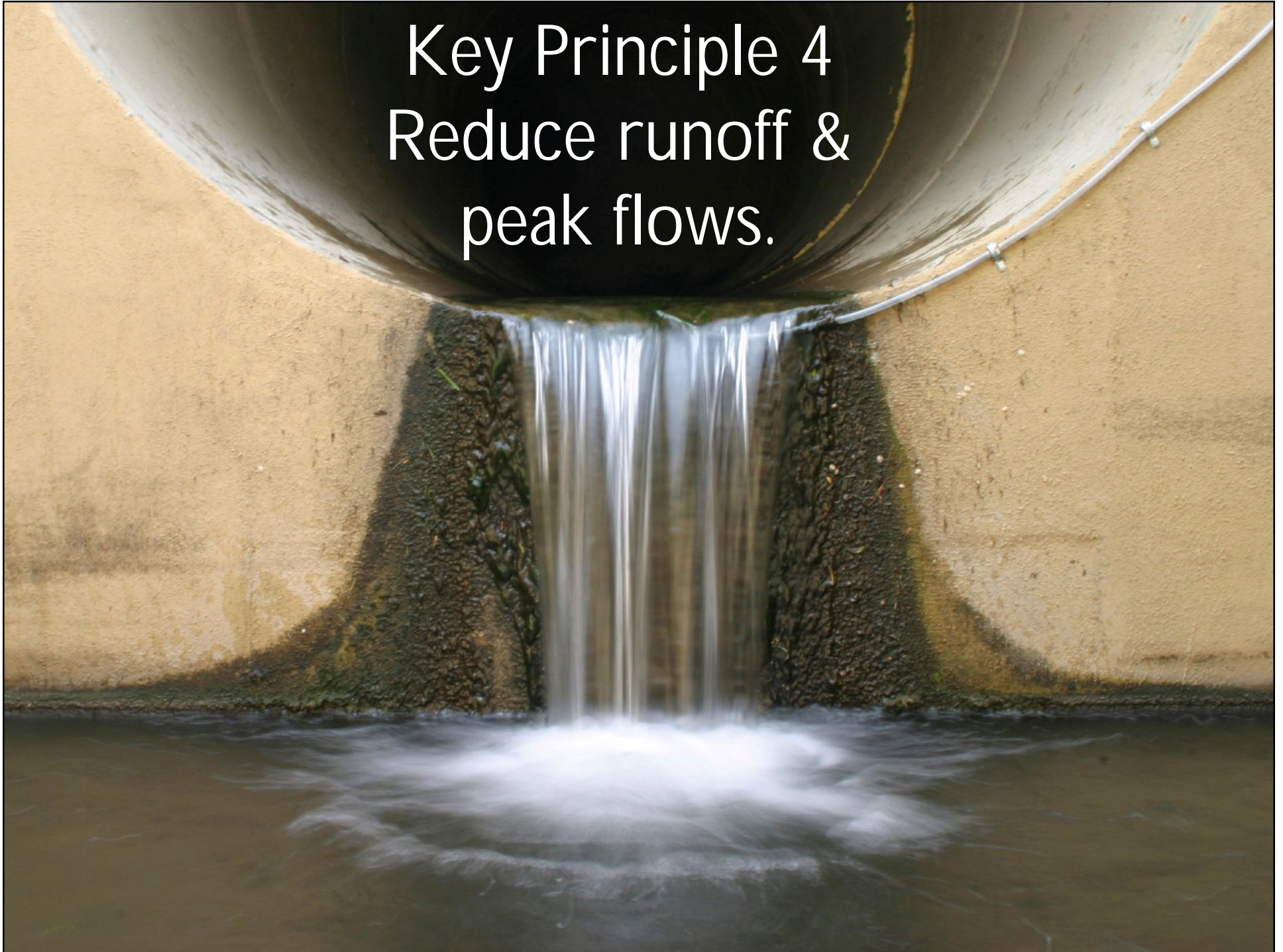
Key Principle 3

Improve Stormwater Runoff Quality.



gross pollutants | coarse to fine sediment | attached pollutants | dissolved pollutants

Key Principle 4
Reduce runoff &
peak flows.



Key Principle 5
Add value while minimising development costs.



Urban Stormwater Drainage System

a little note
on cost.....



WSUD

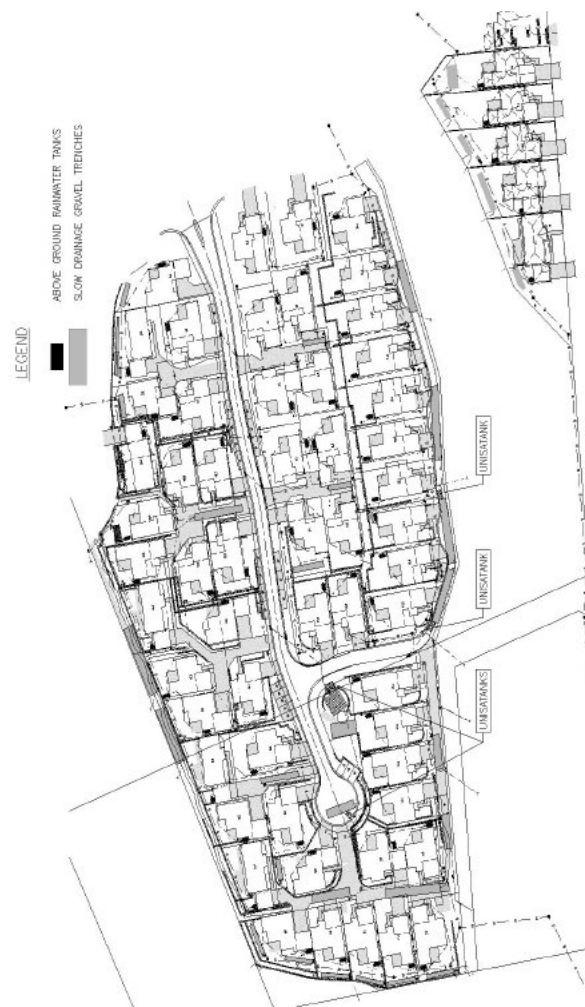


Figure 7. Site Plan for Heritage Mews with adopted WSUD approach

Conventional



Figure 8. Site plan, Heritage Mews Conventional approach

Source: D. Boubli and F. Kassim, 2003, "Comparison of Construction Costs for Water Sensitive Urban Design and Conventional Stormwater Design"

WSUD

Item No.	Description of Item	Total (\$)
1	STORMWATER	
1.1	Stormwater Pits	\$48,880.00
1.2	Stormwater Pipes	\$147,860.00
1.3	Enviro Pod Filter	\$43,450.00
1.4	Headwall and gravel scour/energy dispartor	\$4,595.00
1.5	Detention and Collection Trenches	\$182,877.00
1.6	Rainwater Tanks and Associated Reticulation	\$261,640.00
1.7	UNISTANK	\$23,200.00
TOTAL		\$712,502.00

Table 3. Cost Estimate for WSUD Approach for Heritage Mews

\$712,502

Conventional

Item No.	Description of Item	TOTAL \$
1	STORMWATER	
1.1	Stormwater Pits	\$47,085.00
1.2	Stormwater Pipes	\$210,083.00
1.3	Headwall and gravel scour/energy dispartor	\$10,000.00
1.4	Detention tanks Tank Structure (9 tanks @ 133m ³ each) includes excavation, orifice plate, maximesh trash rack, and access steps and grates	\$540,000.00
1.5	Water Quality Devices	\$132,000.00
TOTAL		\$939,168.00

Table 4. Cost Estimate for Conventional Approach for Heritage Mews

\$939,168

Source: D. Boubli and F. Kassim, 2003, "Comparison of Construction Costs for Water Sensitive Urban Design and Conventional Stormwater Design"

WSUD Cost Summary

- WSUD costs vary according to project.

However typical trends are:

- Smaller Projects – Cost Neutral
- Larger Projects – Increasing Savings

Every Project is Unique “Treatment Trains” are Designed with a Hierarchy of Treatments

Primary Treatments

Secondary Treatments

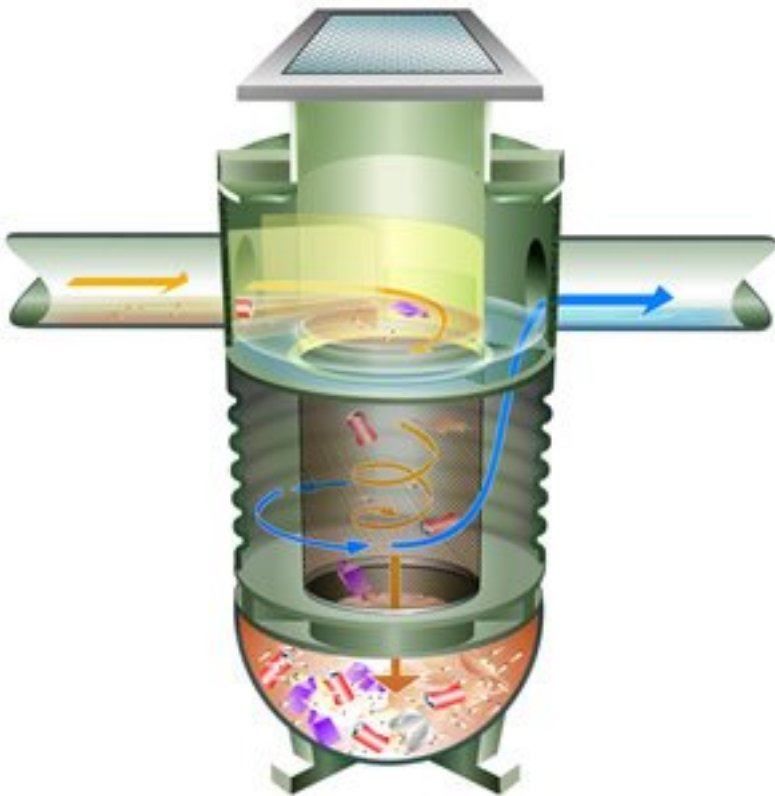
Tertiary Treatments



Primary Treatments

Gross pollutants and coarse sediment.

Gross pollutant traps, grass swales.



Source: <http://www.wsud.org/>

Source: <http://www.wsud.org/>

Secondary Treatments

Fine sediment and attached pollutants.
Swales, Infiltration Trenches, Porous Paving, Bio-Retention Systems, Rain Gardens.



Source: <http://www.wsud.org/>



Source: <http://www.wsud.org/>

Tertiary Treatments

Nutrients and heavy metals.
Bio-Retention Systems, Wetlands.



Source: <http://www.wsud.org/>

Will it Work Here?

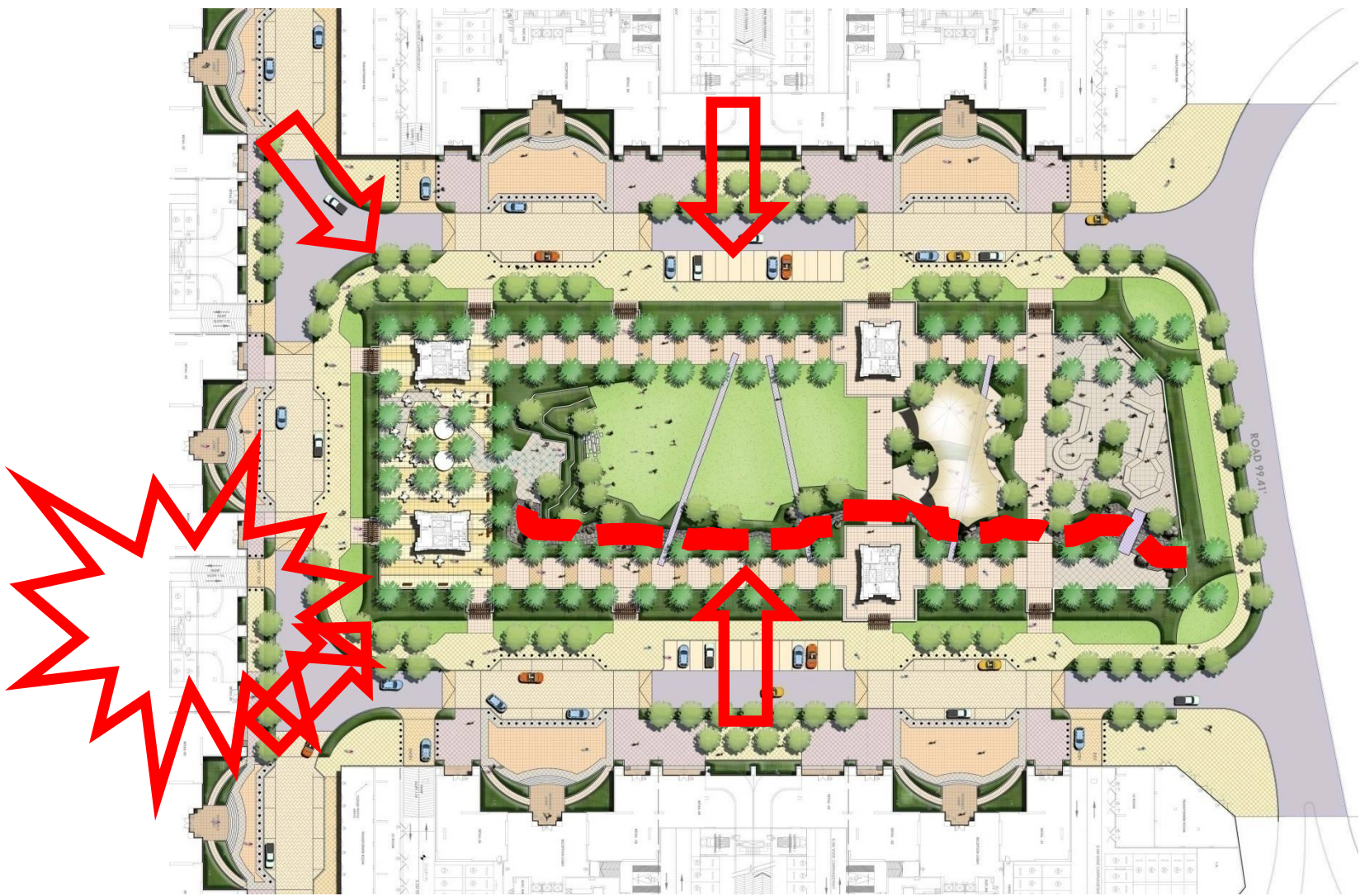
- Increase real estate value.
- Reduce cost of stormwater infrastructure.
(Knowledge Village example).
- Improve stormwater runoff quality.
- Flood mitigation – eh? “Never rains here.

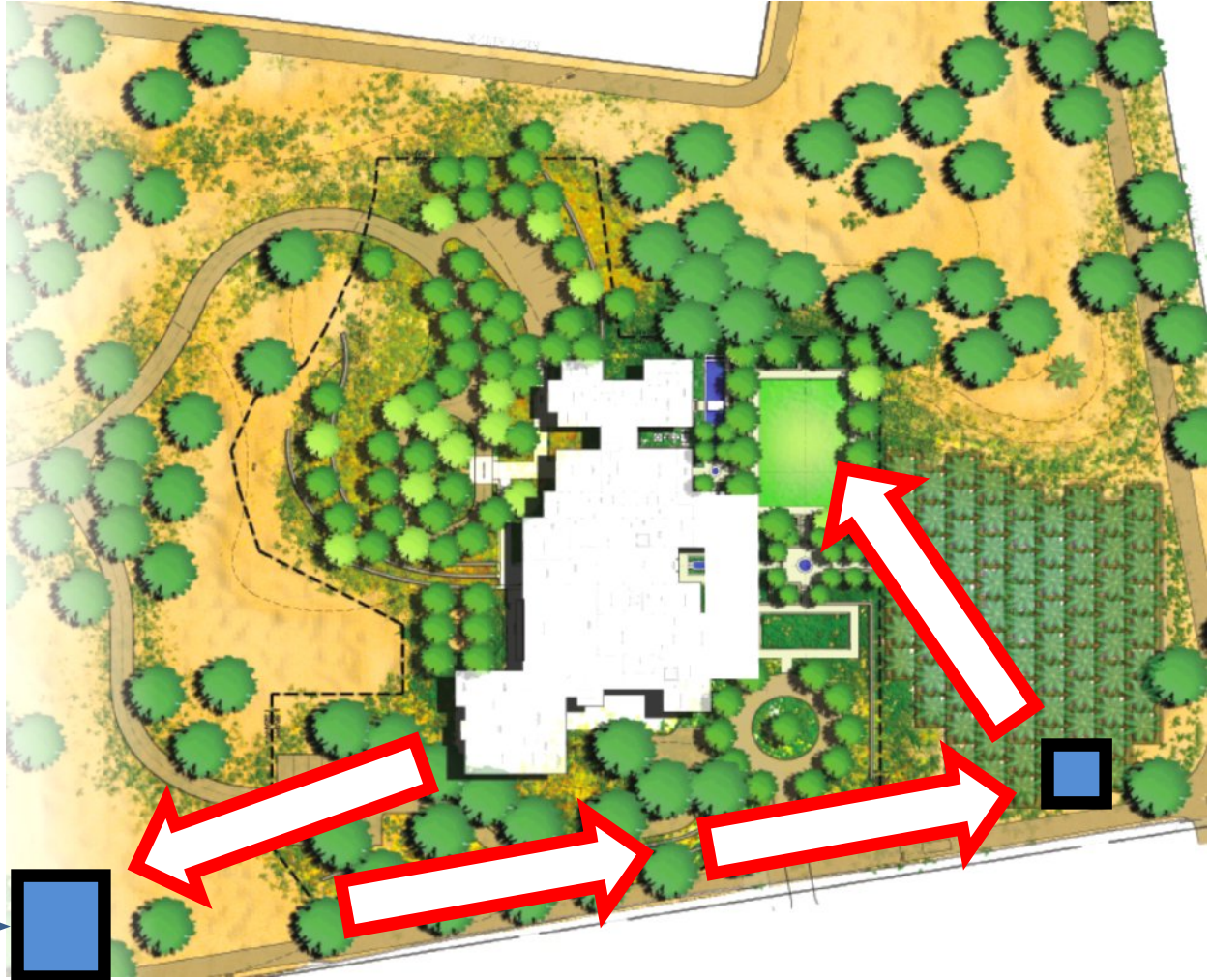
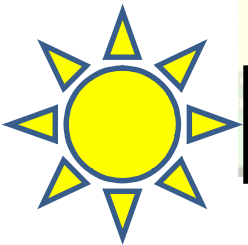


Never Rains Here

Local Case Studies

- Mixed-use Tower Developement
- Private Farmhouse





Our Geographic Reach*



*Air Arabia Desinations

Our Geographic Reach

- UAE based service providers have a geographic reach that encompasses a wide variety of climates and cultures.
- WSUD (stormwater) strategies are needed for many locations within the geographic reach of the UAE.

Summary

Lower rainfall locations

- Reducing the cost of stormwater systems, adding value to real estate by increasing recreational open space, (not to mention flooding).

Higher rainfall locations

- Enjoy the above benefits plus storm water harvesting, protection of natural water systems, and flooding.

Thank you



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WSUD Links
<http://constructedlandscapes.wordpress.com/>