USING BIOPHILIC DESIGN TO ENHANCE STORMWATER MANAGEMENT

Stormwater 2018 Conference

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BIOPHILIC DESIGN

Using nature to enhance the urban form

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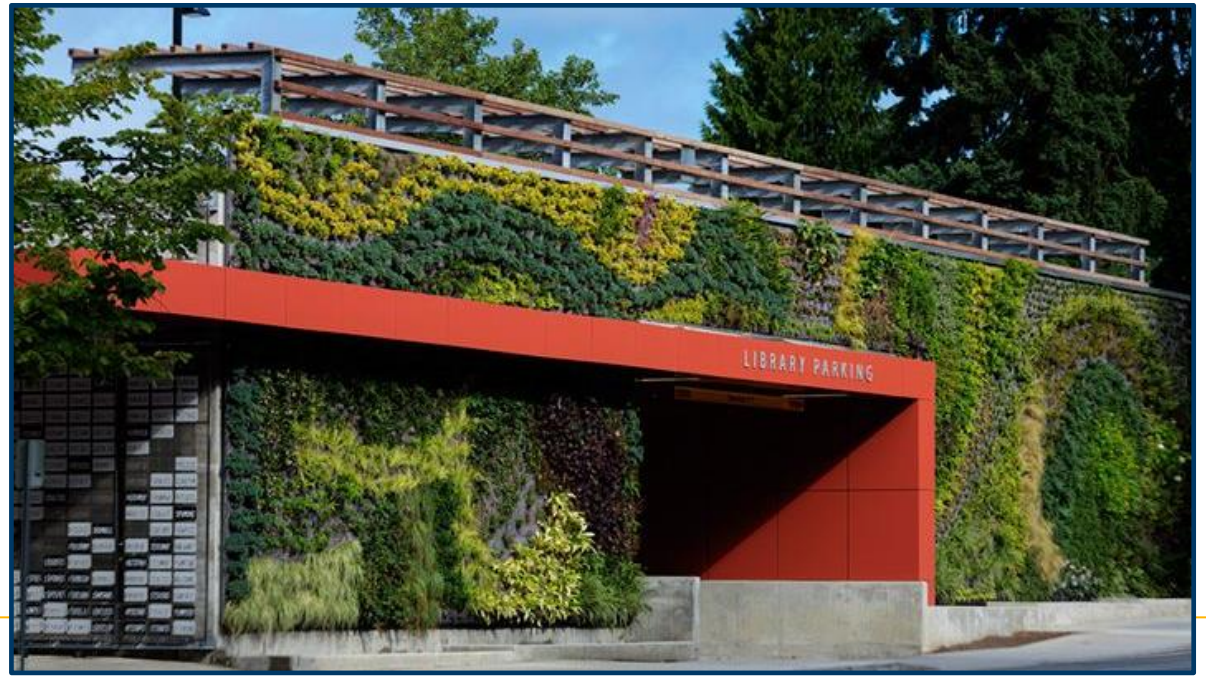
LIBRARY PARKING


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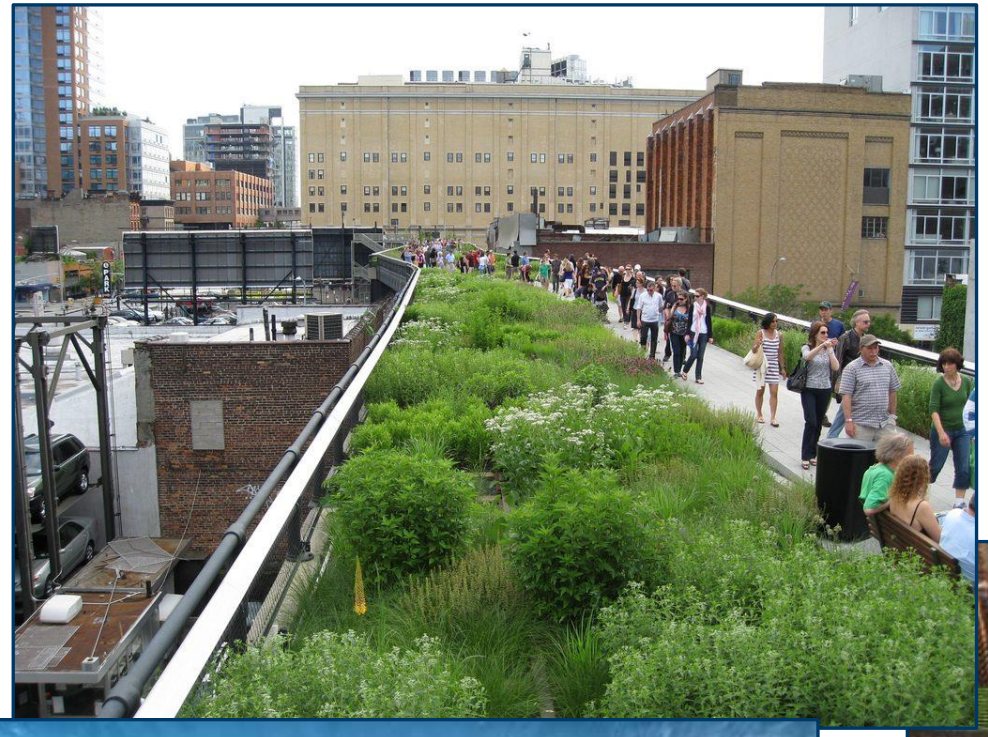
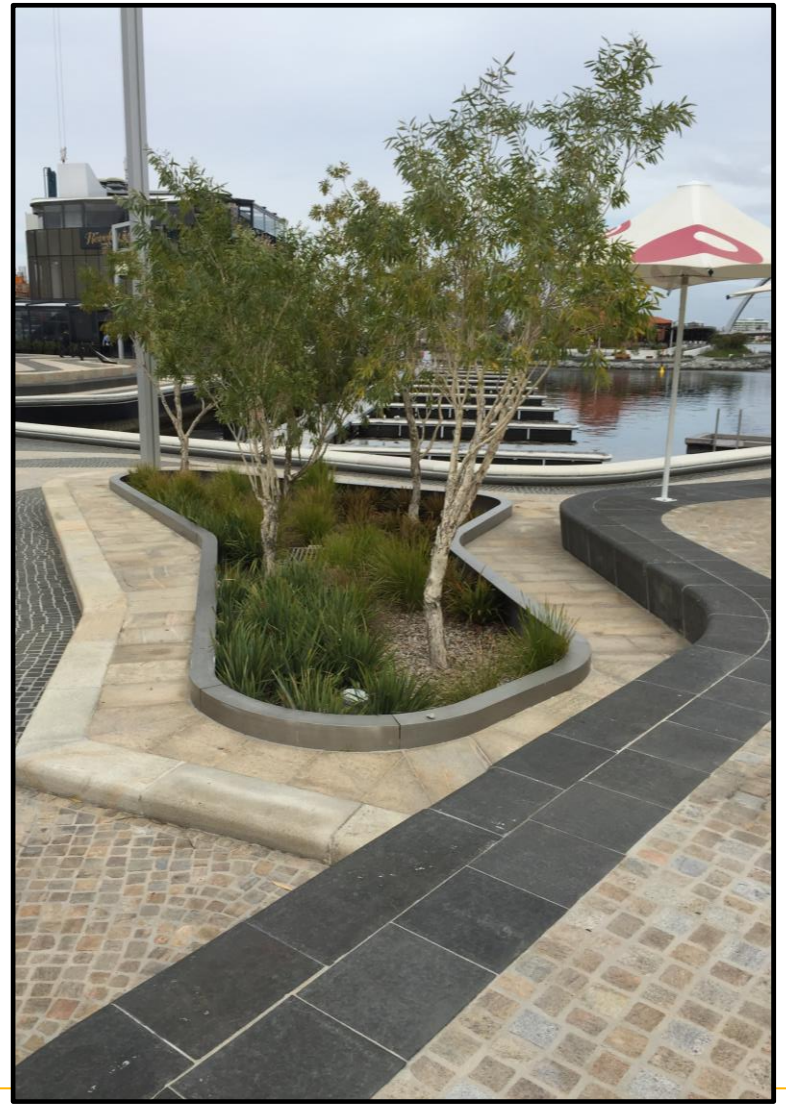



Singapore Sky Garden


Melbourne Urban Forest Dream

Using nature to enhance the urban form – and manage our stormwater?????

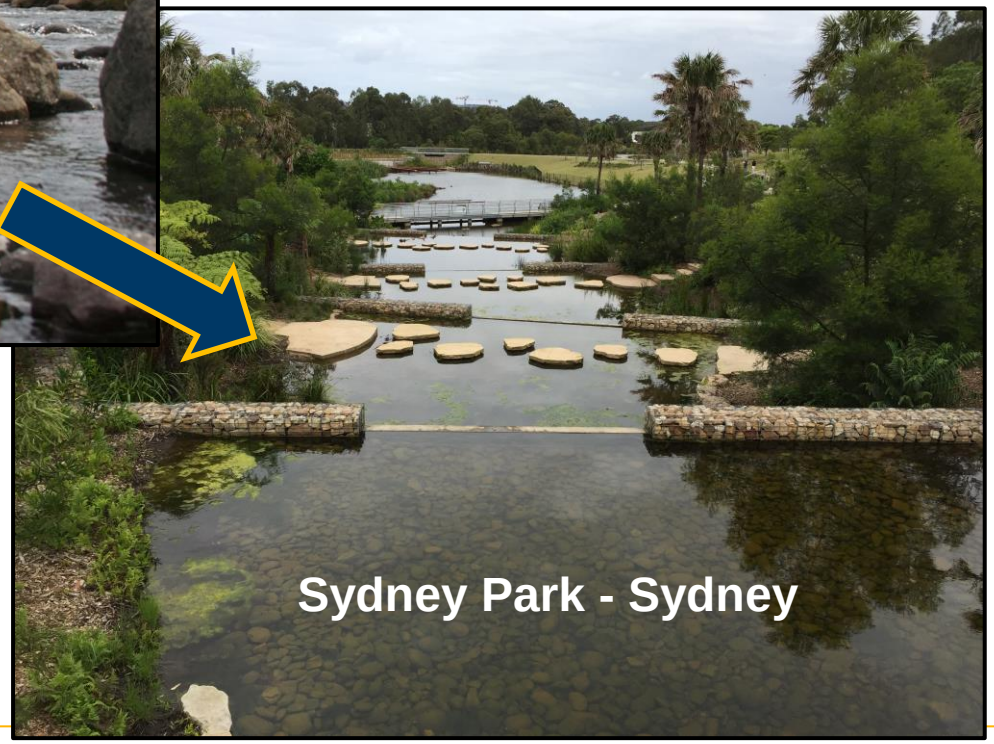


BIOPHILIC DESIGN

Using nature to enhance the urban form

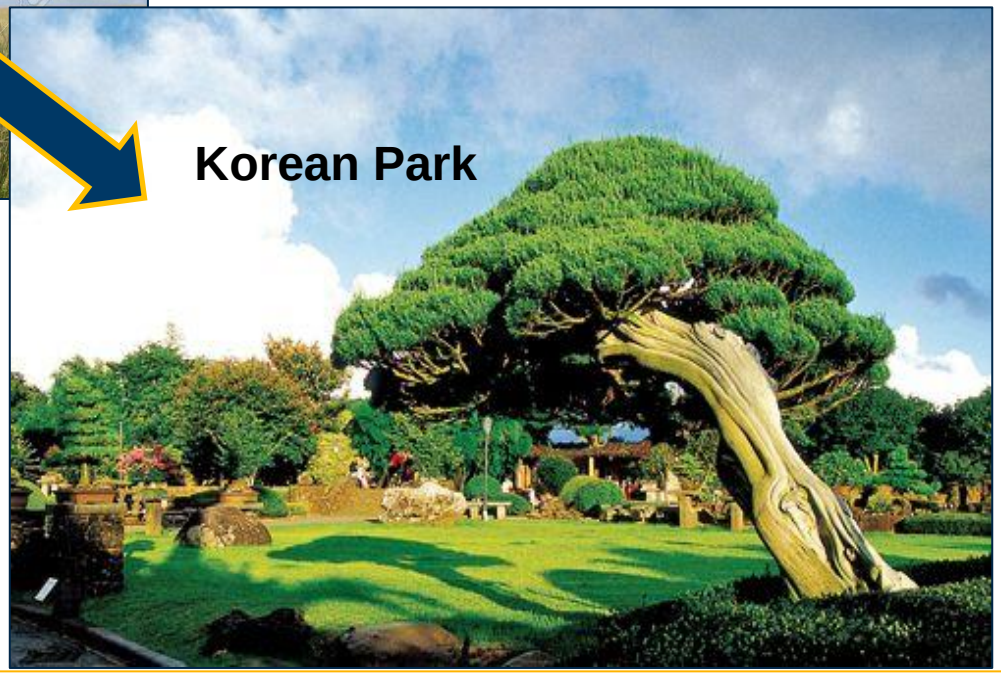
HISTORY OF BIOPHILIC DESIGN…….
FROM 3M YEARS AGO

Evolution of upright walking apes adapting to savannah landscape

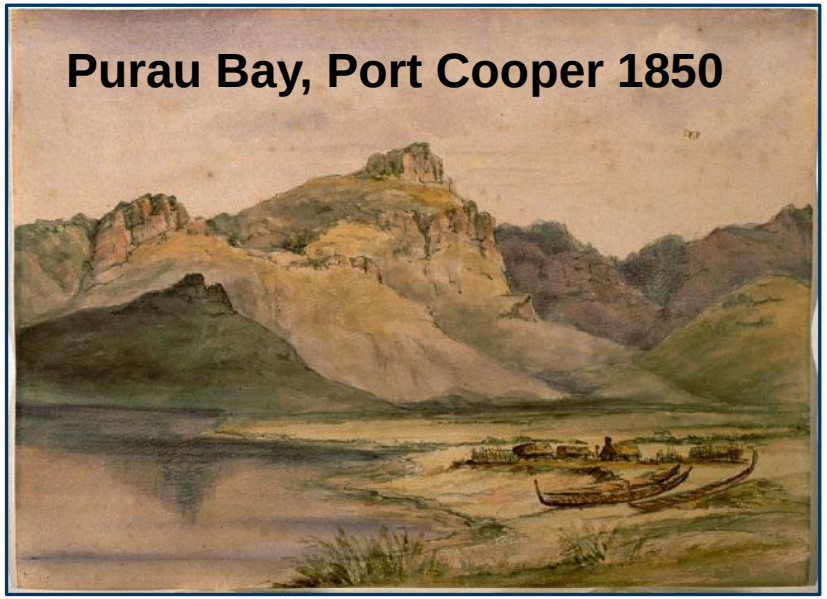


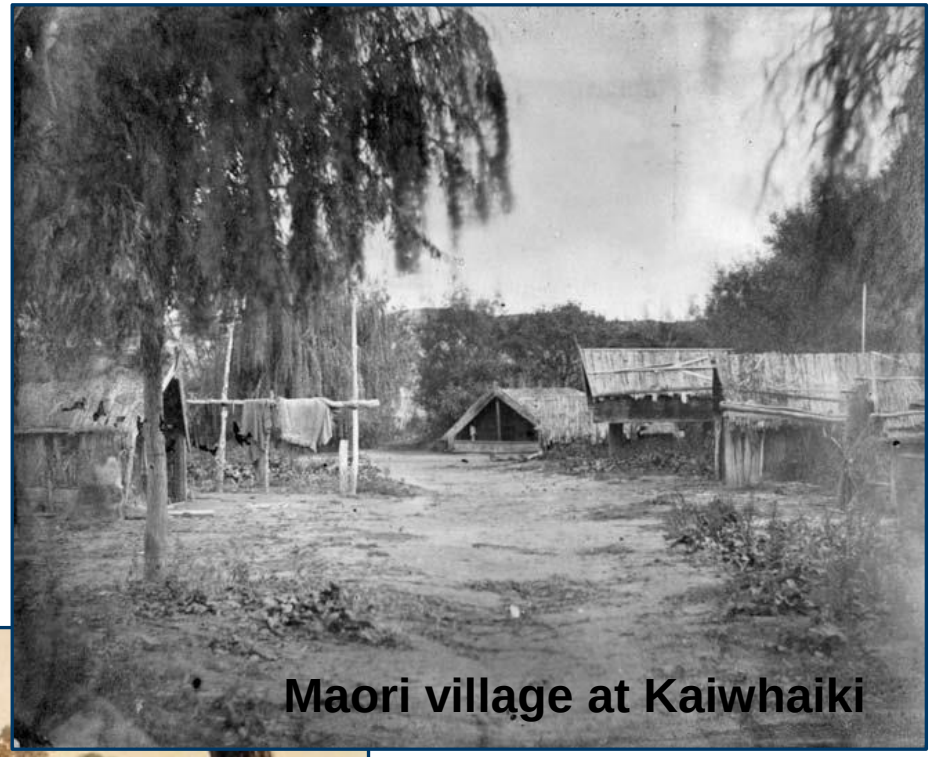
Hardwired into us to be attracted and respond to elements of nature

CARRIED INTO ALL PARTS OF THE WORLD

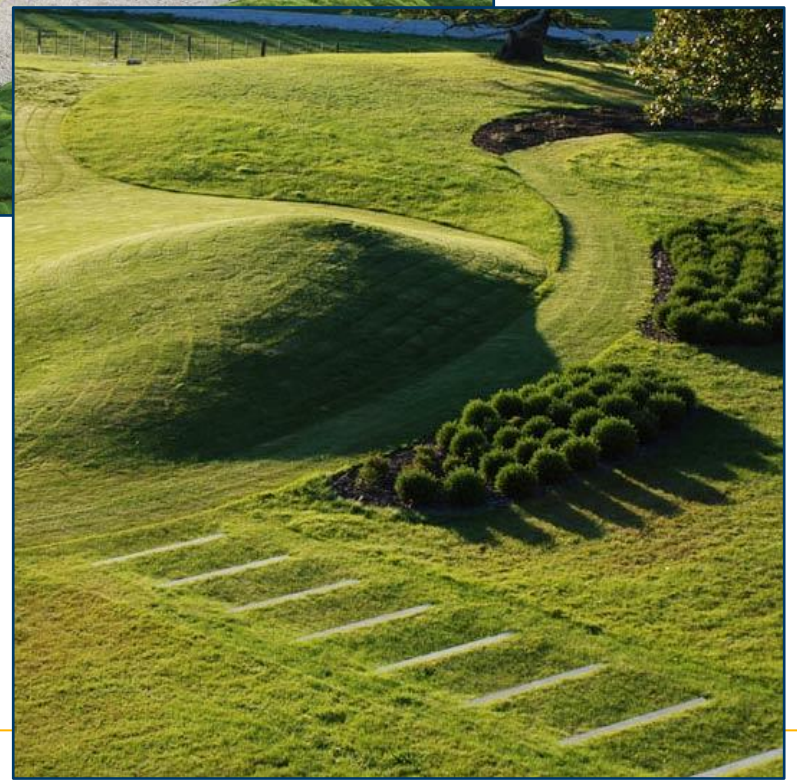


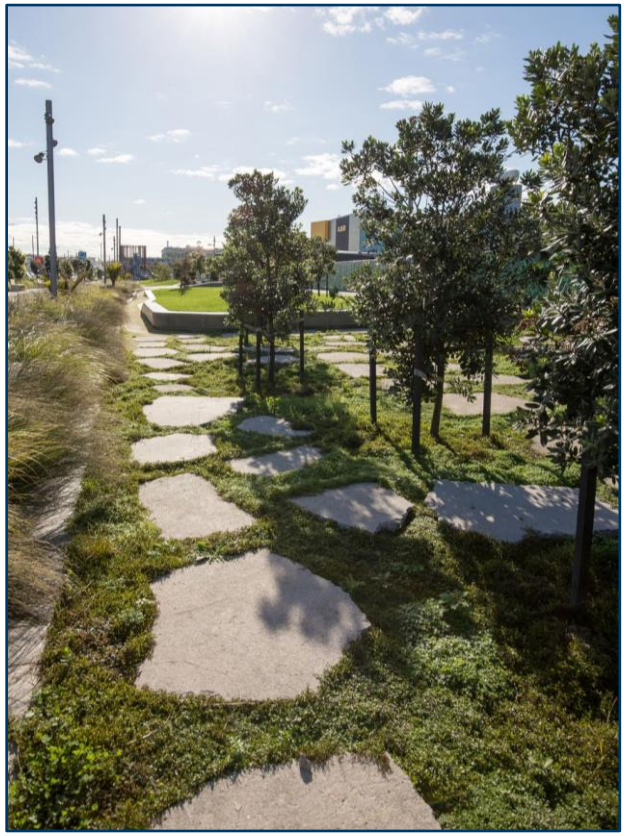
EVEN NEW ZEALAND, BOTH THE ORIGINAL LAND MANAGERS ….





AND POST EUROPEAN SETTLEMENT





RECENT HISTORY

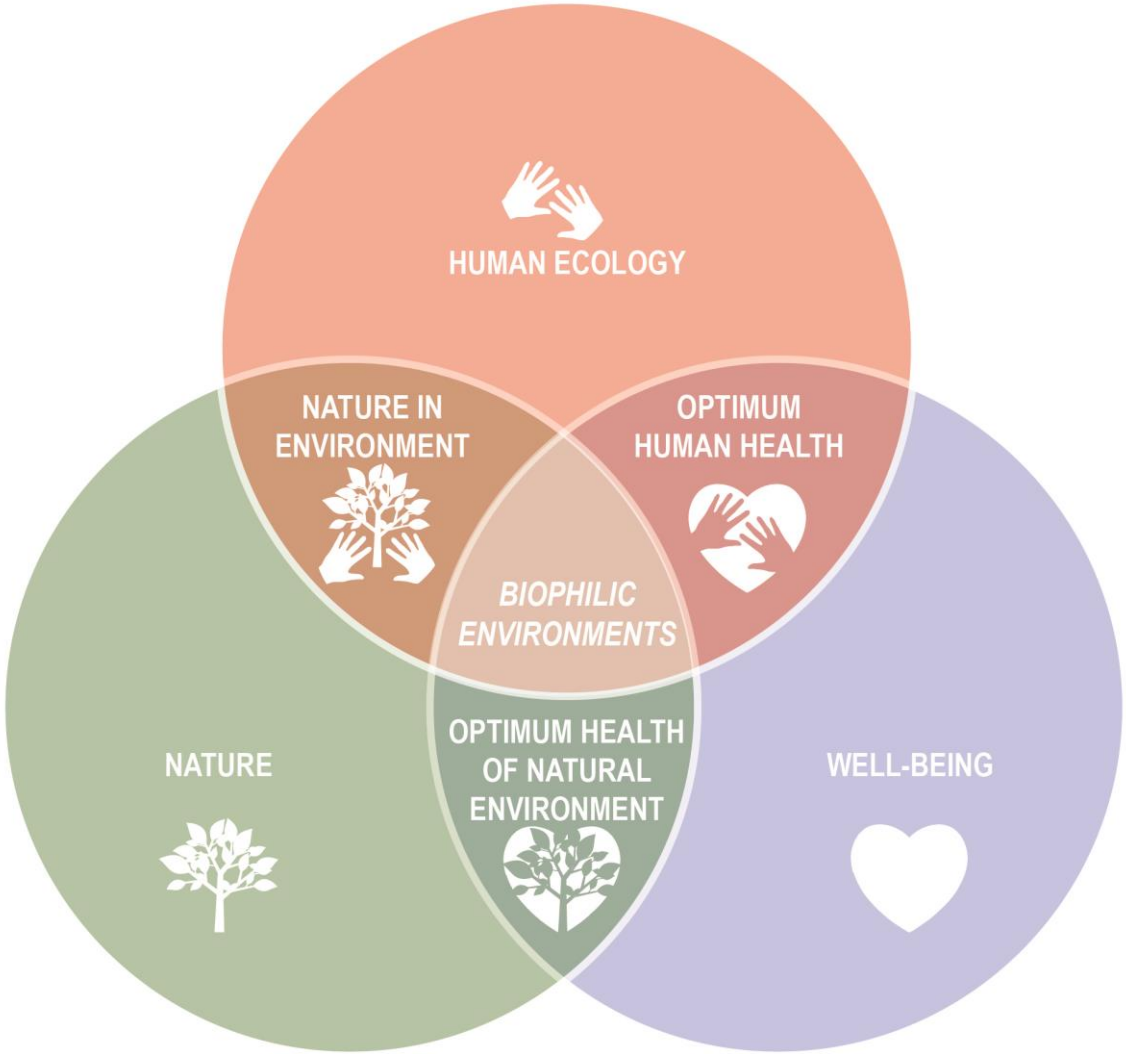
- Biophillia termed first used in 1964
- 1960/70's research and practice
- Initial focus on buildings
- 1984 termed became widespread through the book 'Biophillia'
- Last 2 decades widespread research into the benefits of incorporating natural elements into the built environment
- Wellington has been Biophilic Cities Partner since 2013

Reservoir and office complex, Indian Desert

Bosco vertical, Italy

BIOPHILIC DESIGN

Incorporation of specific natural elements to enhance the urban environment



RESEARCH OUTCOMES

Scientific studies showing:

1. Reduced stress/depression/illness
2. Improved productivity
3. Enhanced learning comprehension
4. Improved recovery rates from illness
5. Increase land value
6. Reduced crime
7. Increased sales in retail areas
8. Urban cooling and water management

MISSING COMPONENT TO CURRENT SUSTAINABLE DESIGN

- People appreciate and work on those things they value
- Being immersed in natural processes builds appreciation of the local space and wider environment

APPLICABLE AT ALL LEVELS

. . . Just Another Way Of Thinking

BIOPHILIC DESIGN

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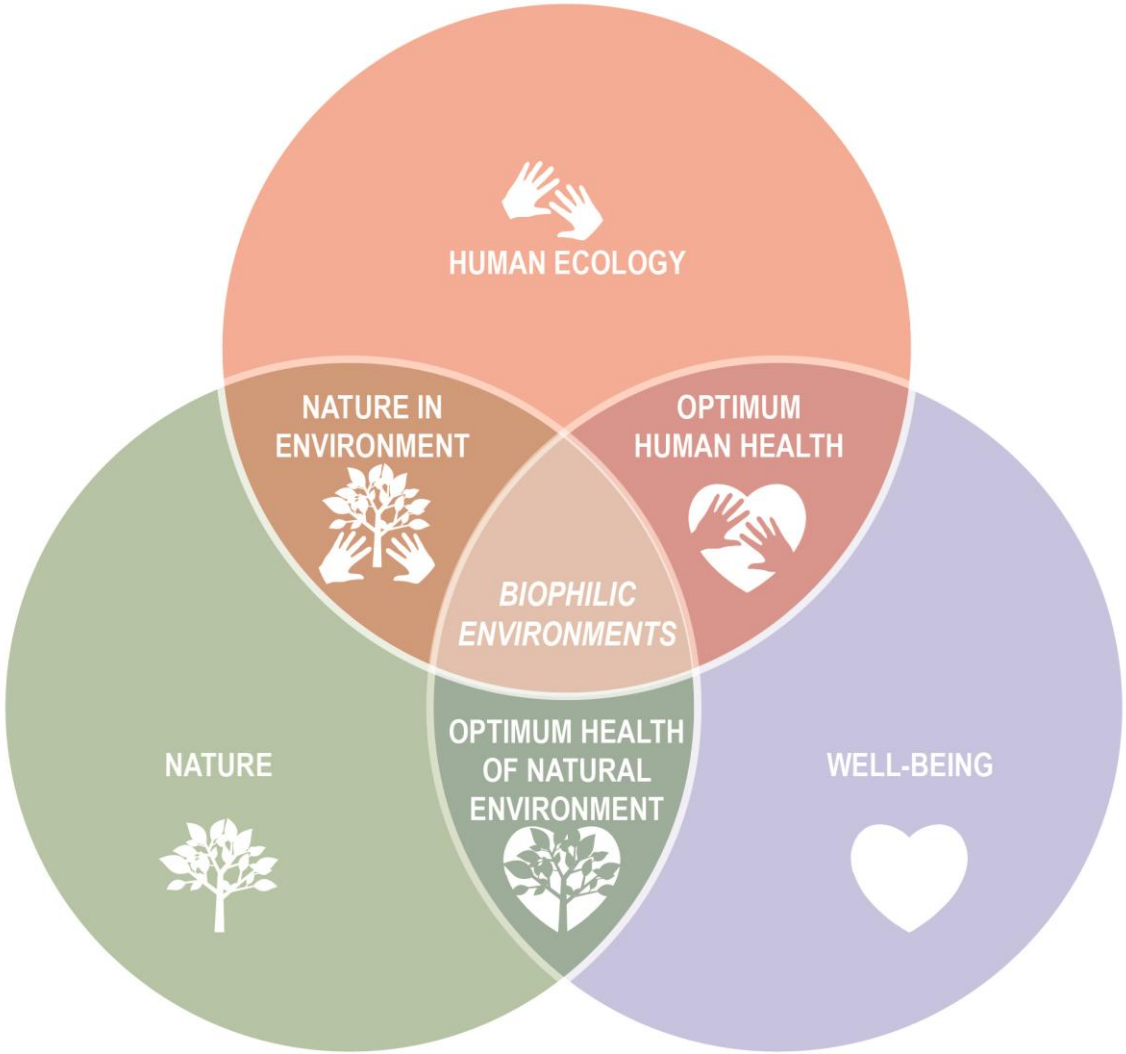

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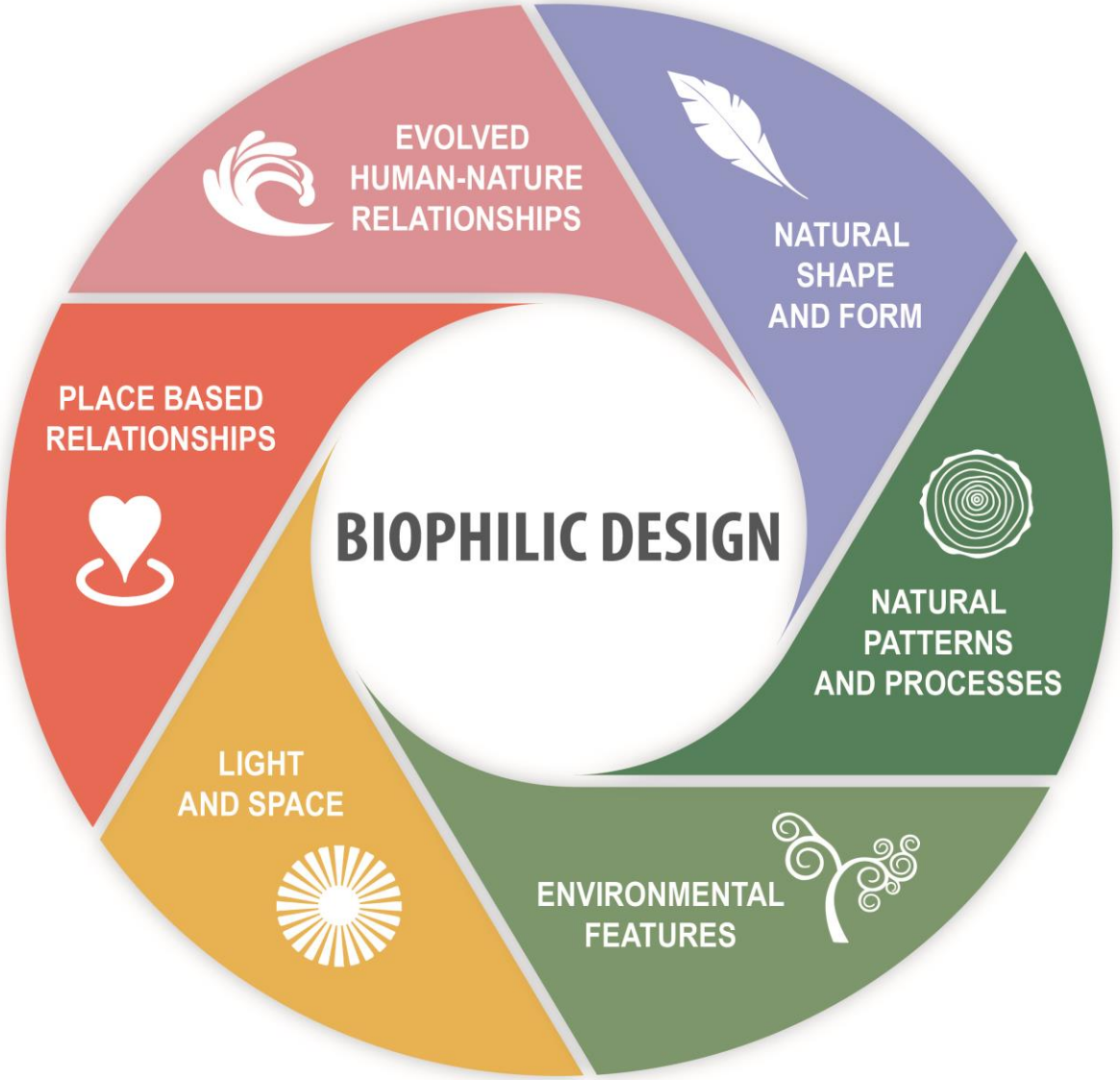
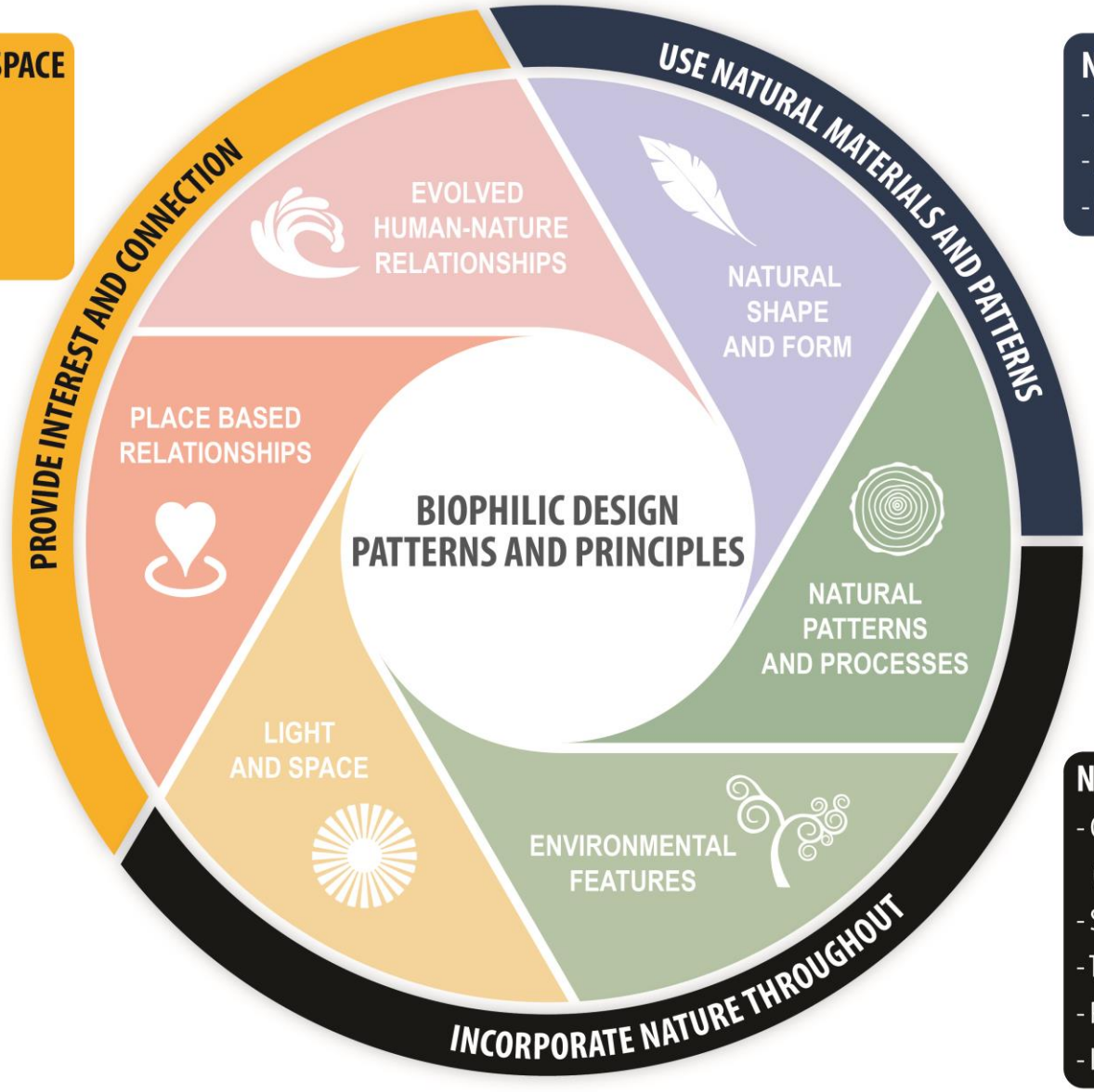


PATTERNS AND PRINCIPLES

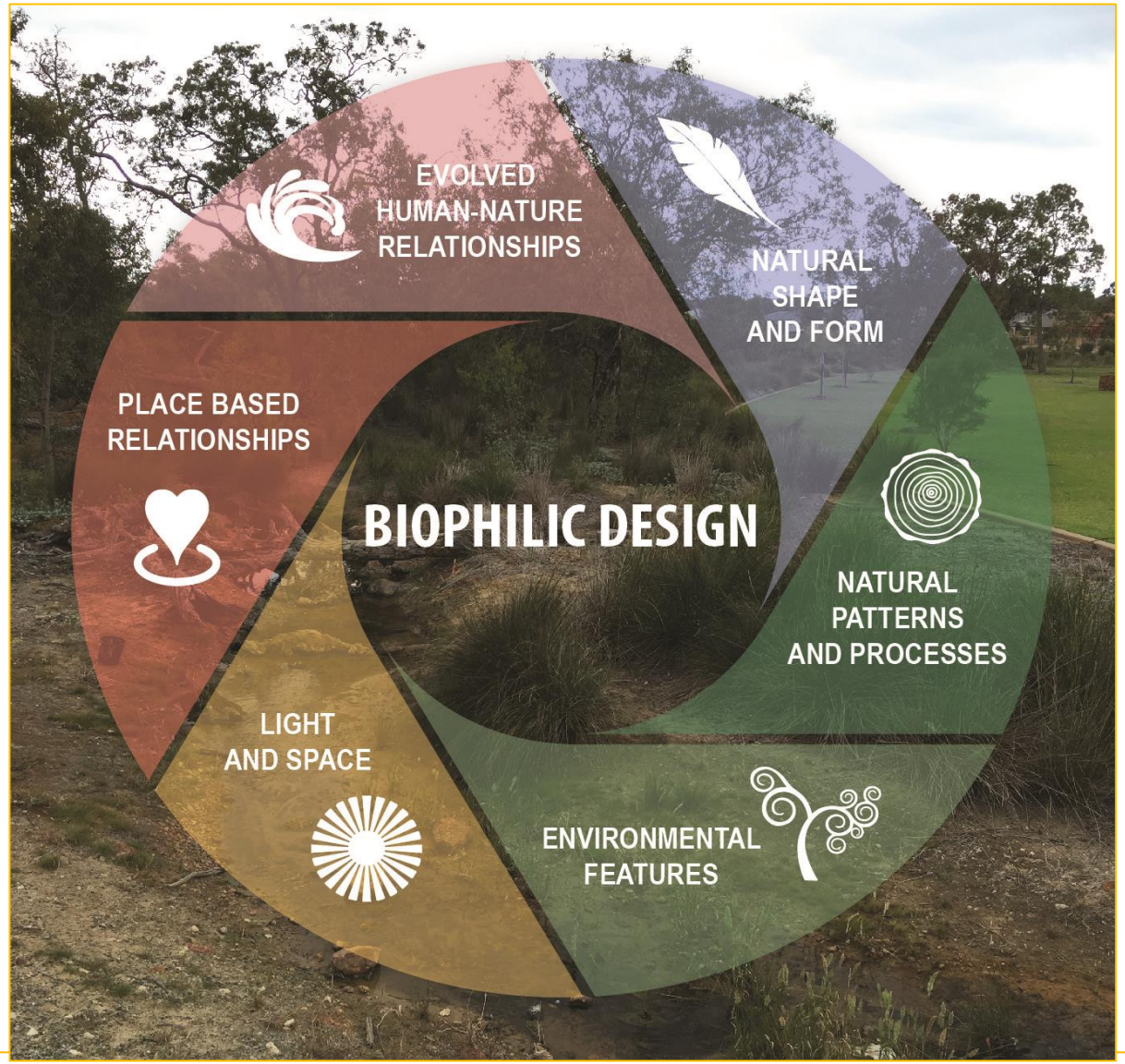
NATURE OF THE SPACE
- Prospect
- Refuge
- Mystery
- Risk / Peril



NATURAL ANALOGUES
- Using natural material
- Biomorphic shapes / forms
- Mix of complexity and order

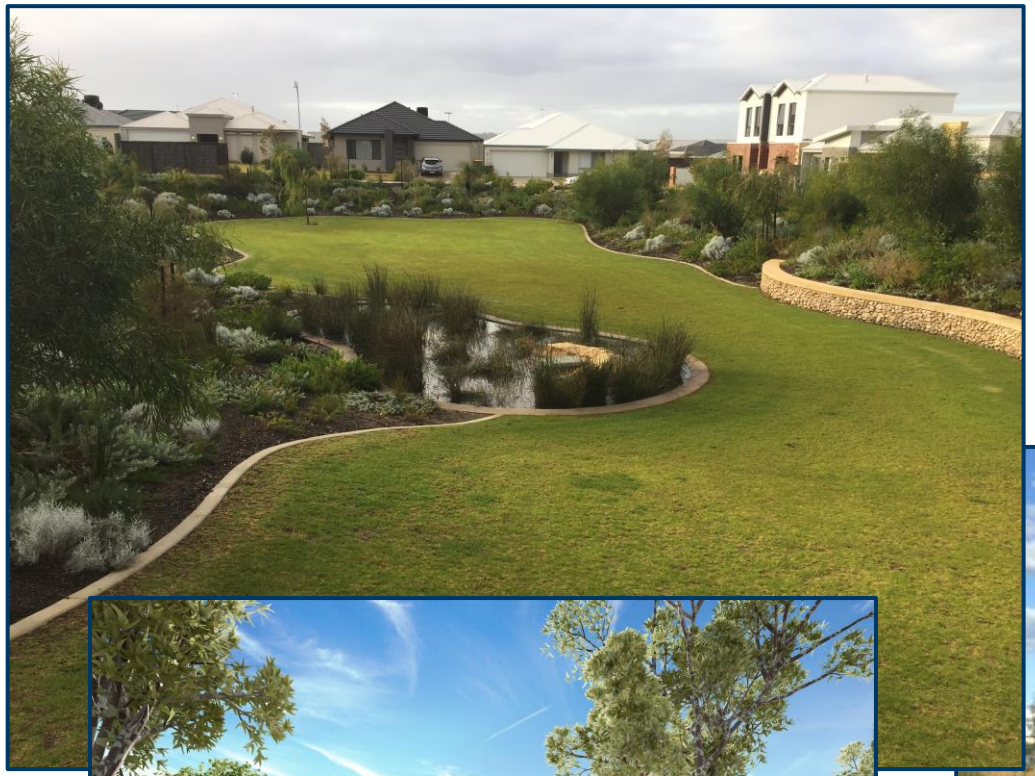
NATURE IN THE SPACE
- Connection to Nature (visual and non visual)
- Sensory Stimuli
- Thermal and Airflow Variability
- Presence of Water
- Light

WHAT DOES THIS MEAN FOR STORMWATER MANAGEMENT IN NZ?



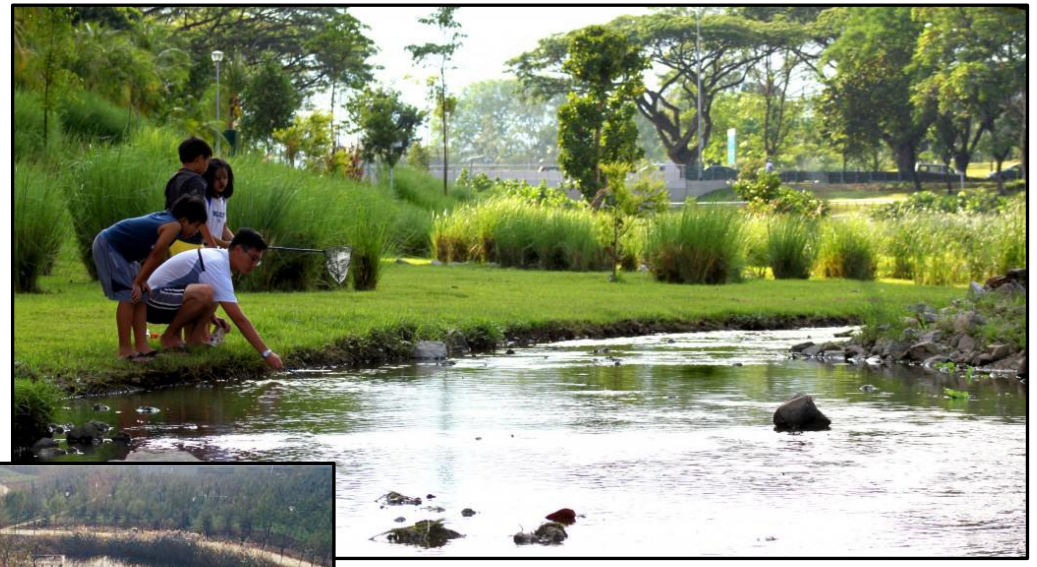
NATURE IN THE SPACE: CREATING NEW ‘NATURAL AREAS AND CONNECTIONS

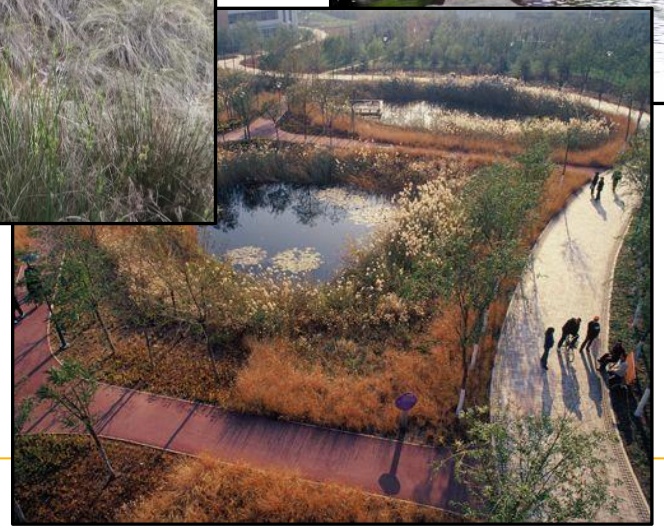
WATER MANAGEMENT AND LANDSCAPING – MAXIMISE THE LINK



MULTIPLE USE CORRIDOR OPTION

- Use Multiple Use Corridor to link urban areas/ town centre /schools etc
- Provide pedestrian/cycle link
- Include living stream with wetland chain for habitat
- Flood control



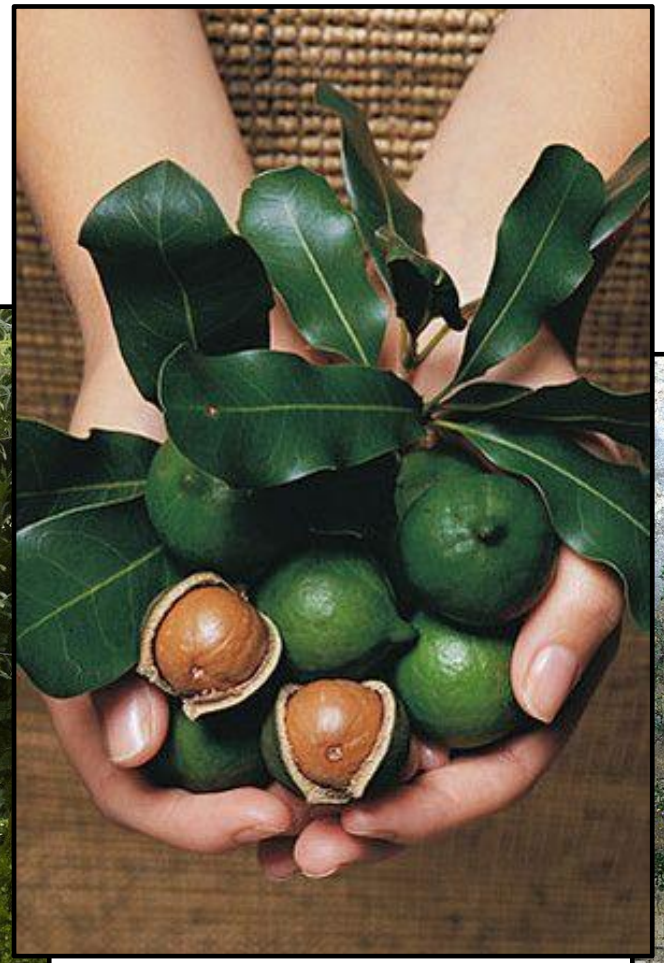


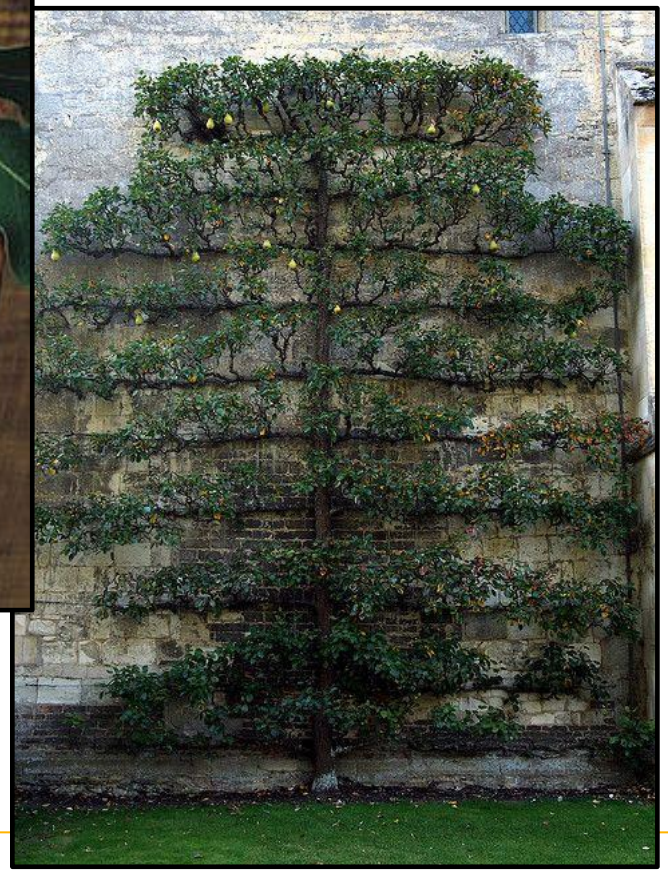
URBAN TRAILS

Link houses directly to green spaces …

….then use trails/MUC to link to onsite/offsite vegetation

BRING USEFUL AND EDIBLE PLANTS INTO THE MIX





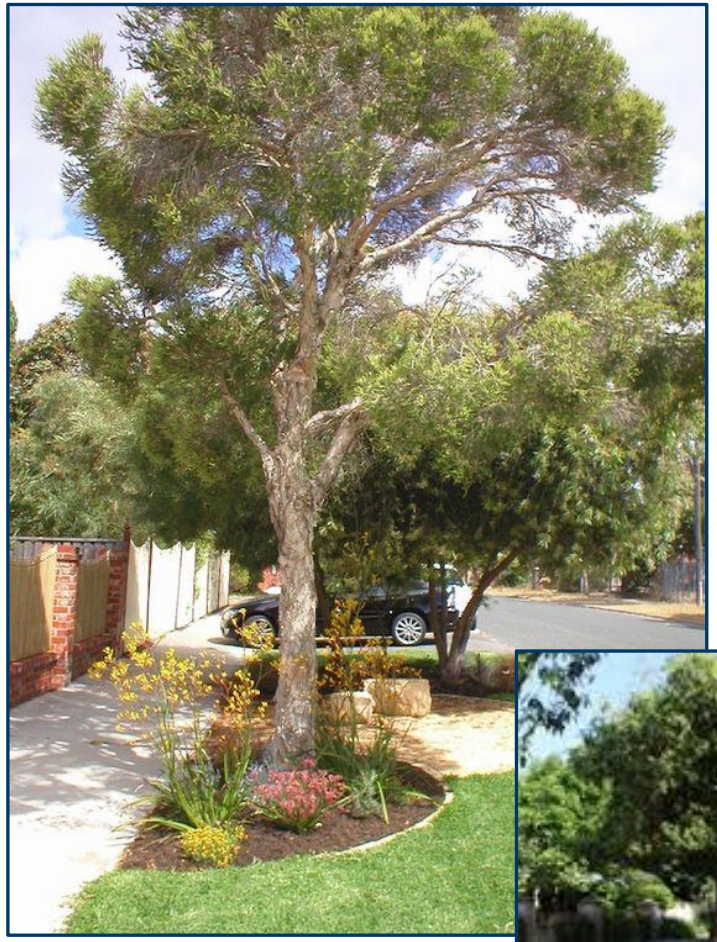
…..INCLUDING NATIVE FOODS

Local flavour and interest

Hardy and provide sense of place

ESPECIALLY INTO THE STREET

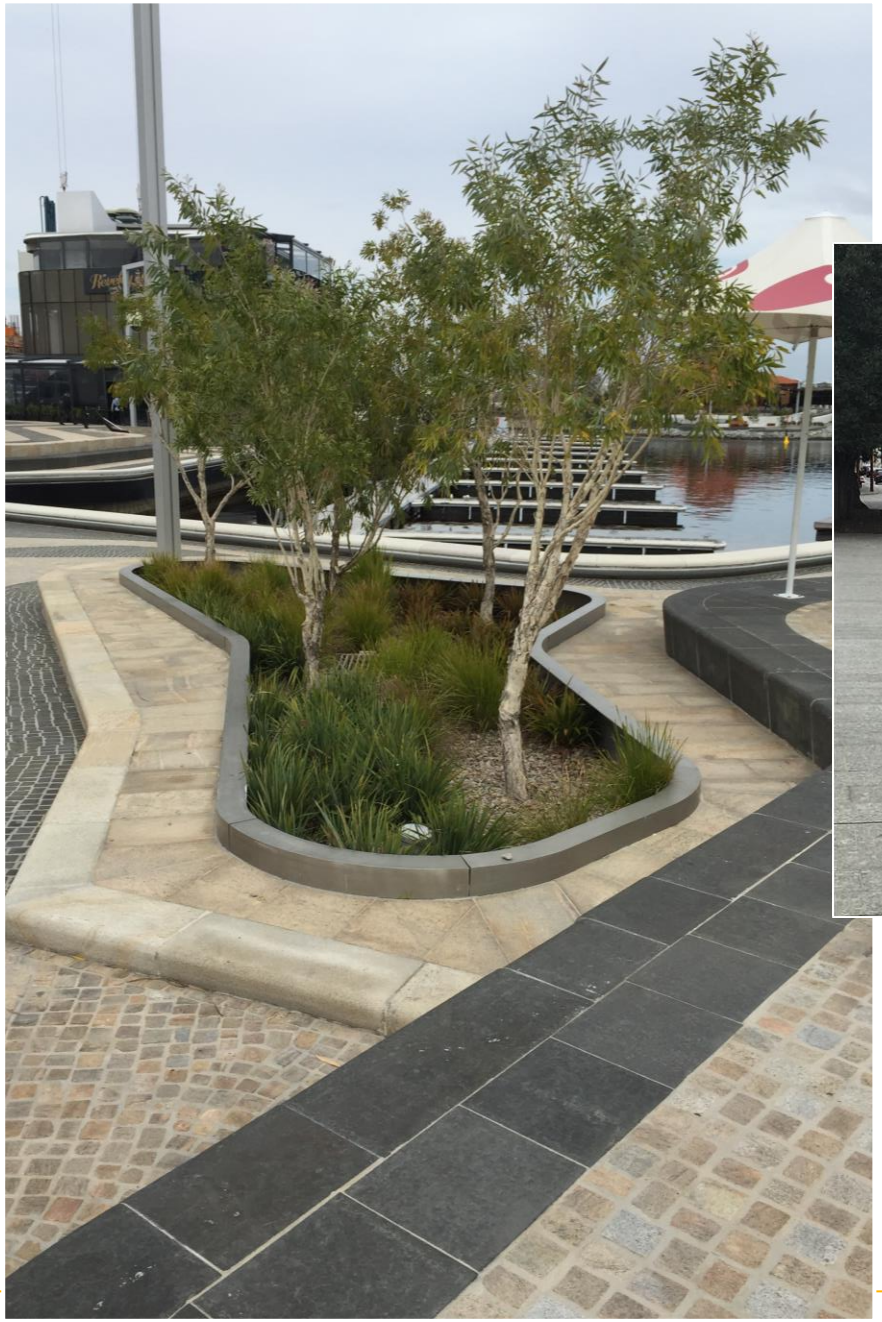
- 11-25C cooler under shade
- 1-5C cooler overall through evapotranspiration



LOCAL SENSE OF PLACE AND TRAFFIC CALMING .. …WITH STORMWATER MANAGEMENT

STREET VERGES

CBD STREETS AND SPACES

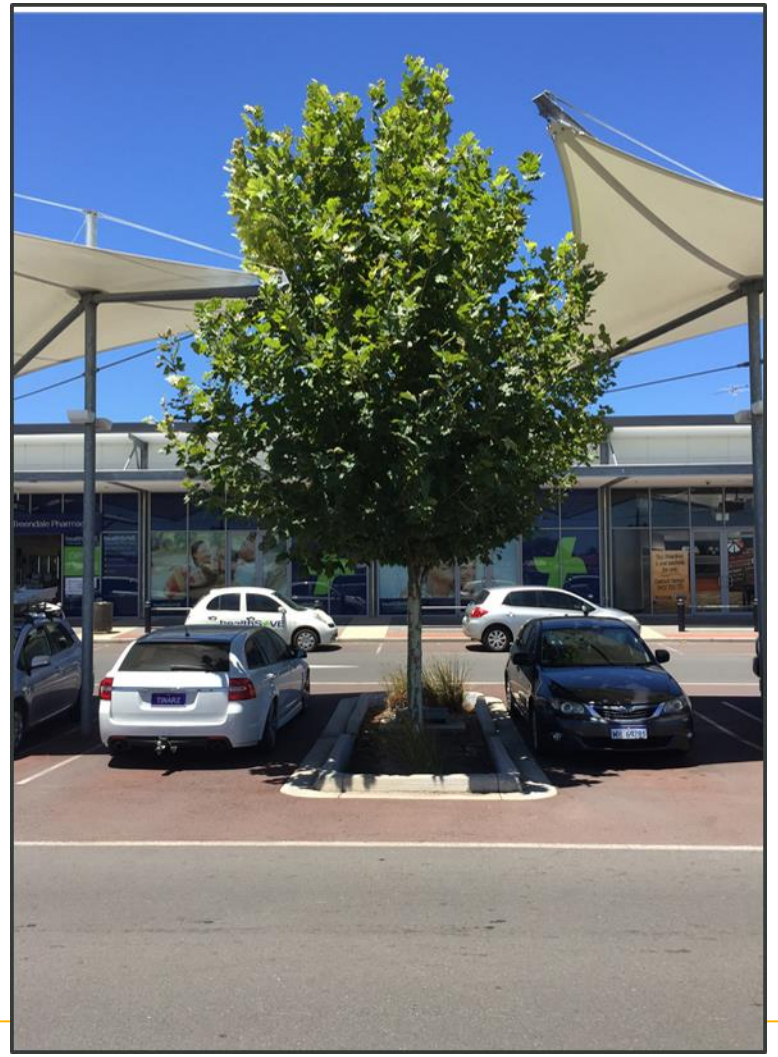


BIODIVERSITY AND LANDSCAPING

LANDSCAPING AND OVAL WATER TREATMENT

DEMARCATION AND SAFETY

MIDDLE OF THE STREET WITH PARKING



AT THE STREET LEVEL

BEFORE: 12m road, 8m wide lots, with 6m garage frontages

AFTER:

- Traffic calming, using vegetation and rocks instead of bollards
- Pocket gardens to treat water and provide interest and shading.

AND AT A BUILDING SCALE

CENTRAL PARK BUILDING- SYDNEY

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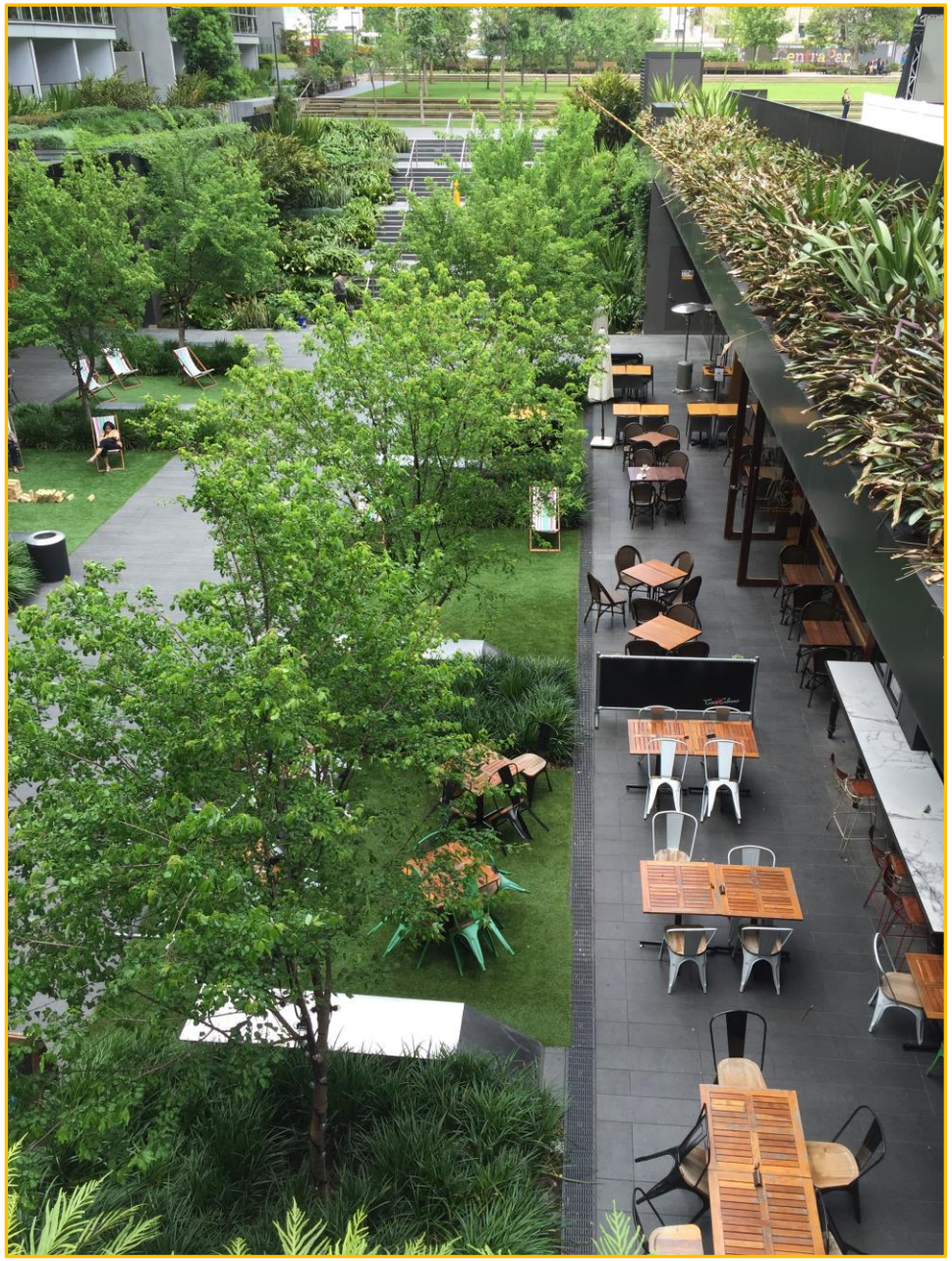

CENTRAL PARK EXAMPLE – TREATMENT IN BASEMENT

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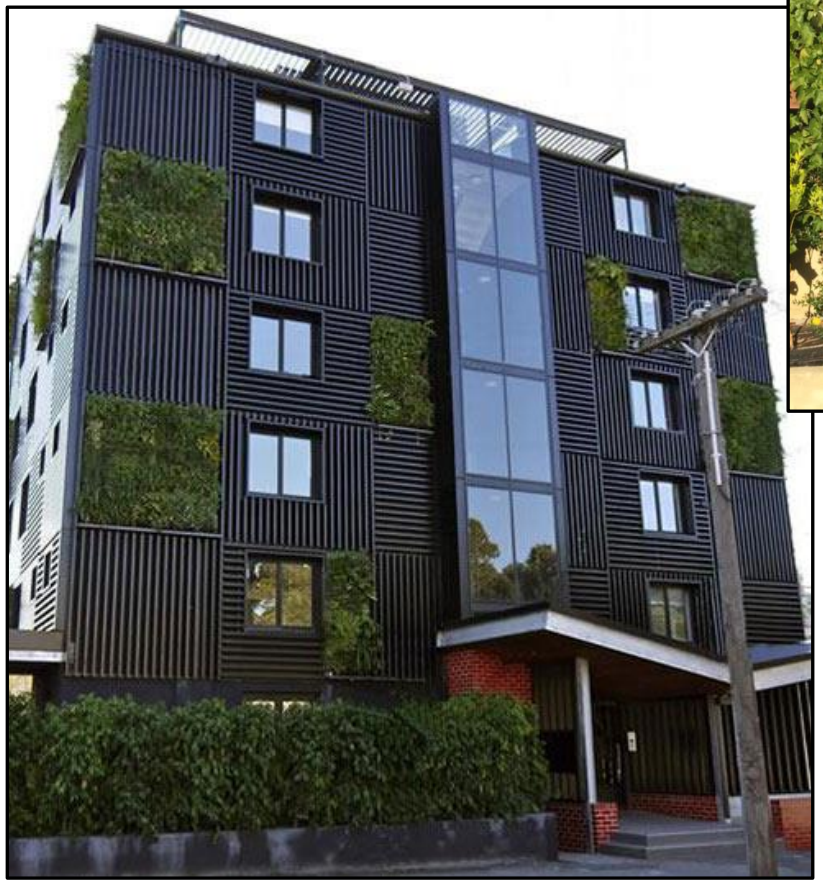
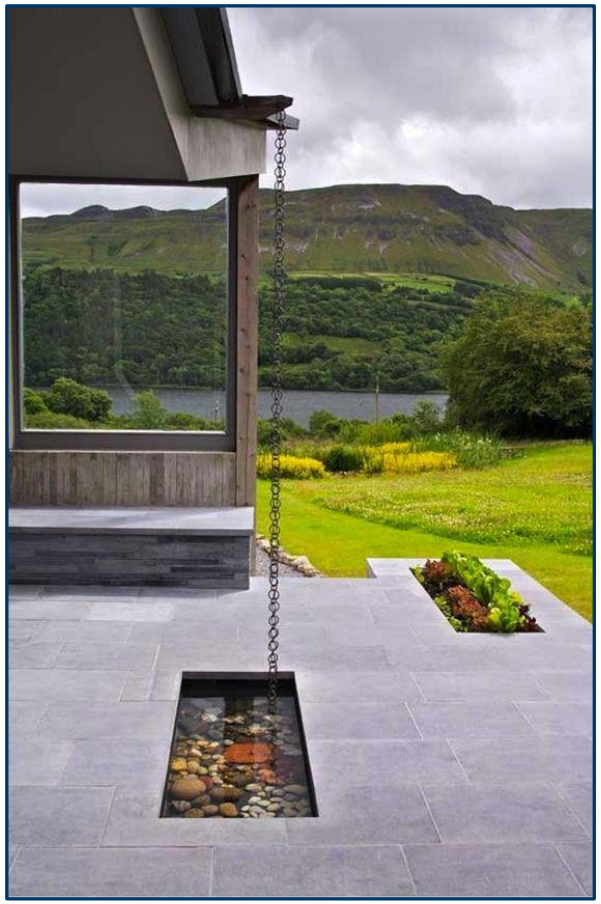
DRY CLIMATE OPTIONS

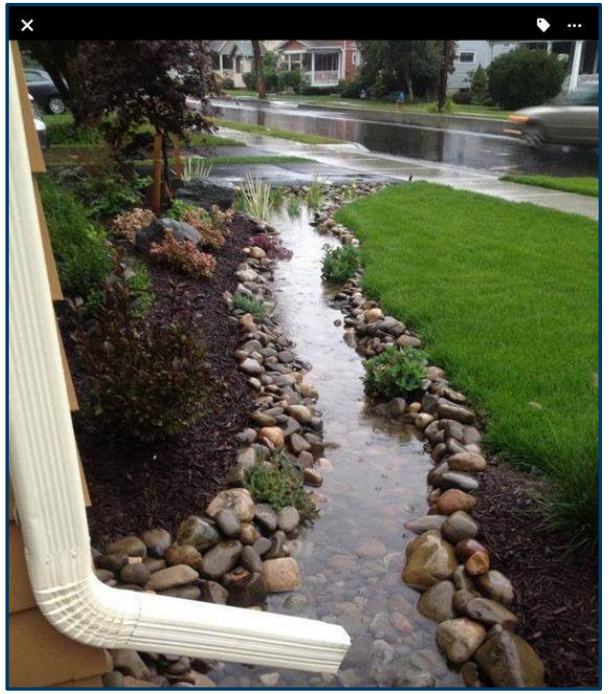


INCLUDE

- Shade
- Native plants
- Interaction with water
- Natural material

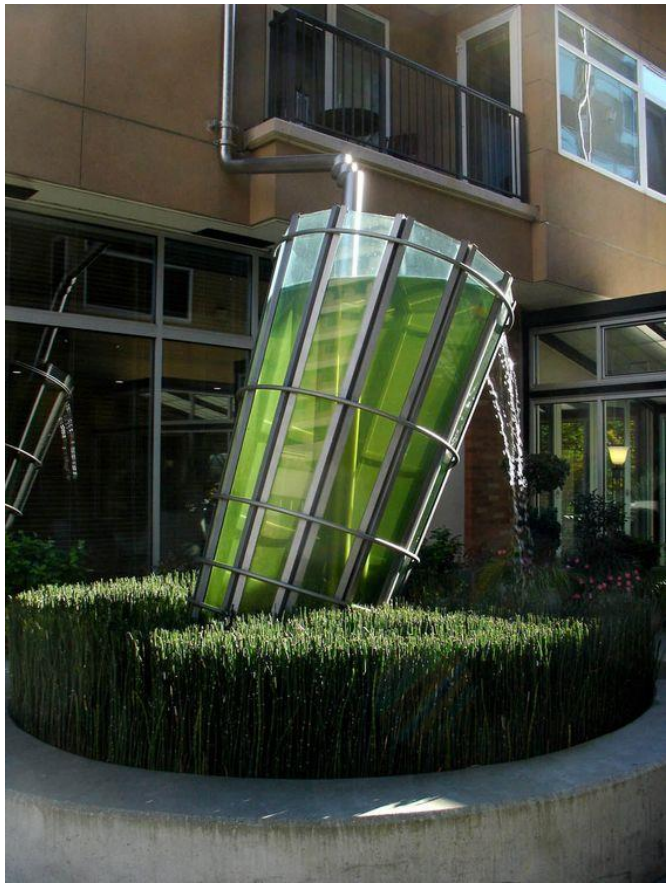
DIFFERENT WAYS TO BRING WATER MANAGEMENT INTO A LOT





Meets best practice from latest DoW guidelines

OR TO REALLY STRETCH THE THINKING….



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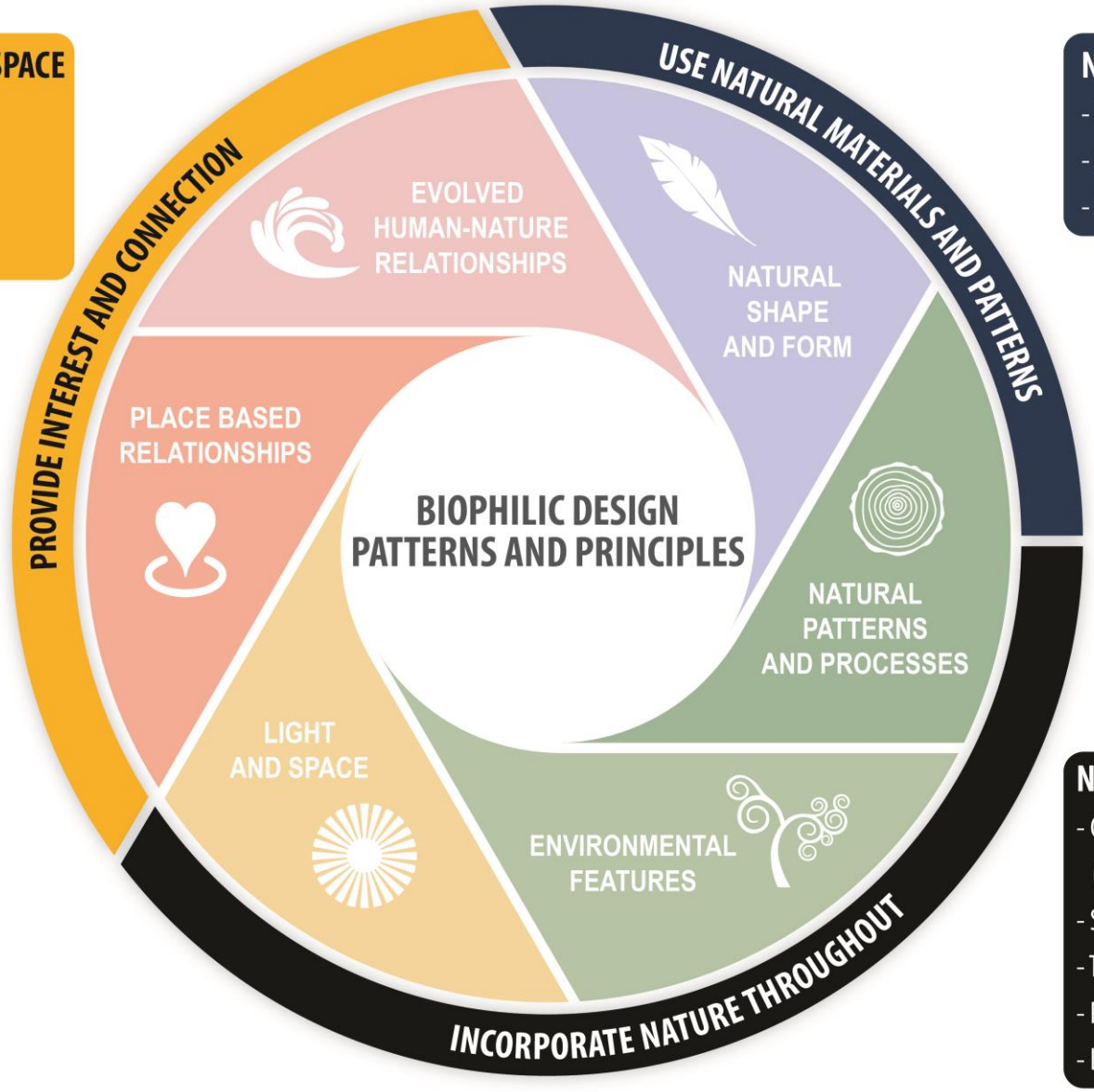

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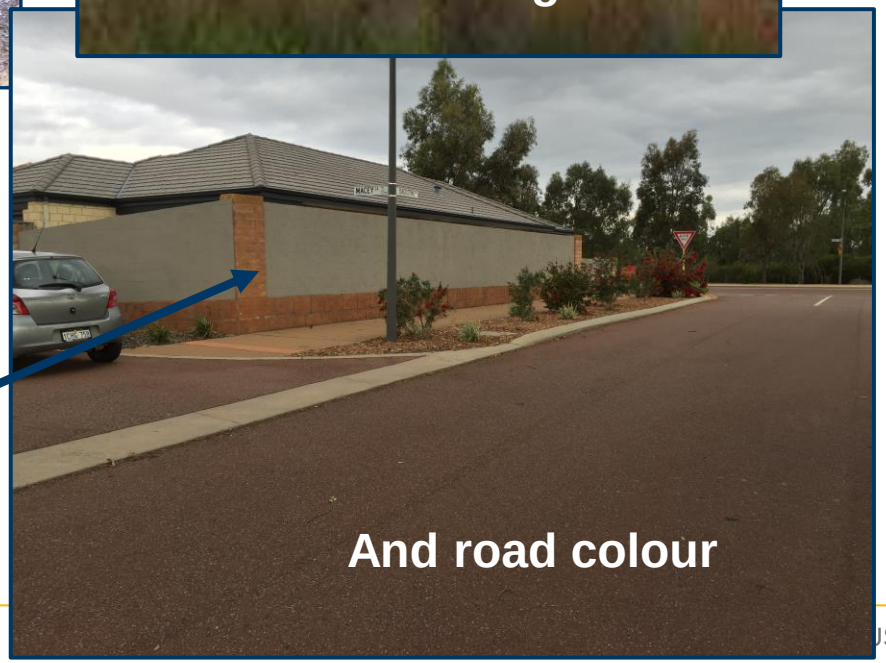
USE OF NATURAL MATERIALS

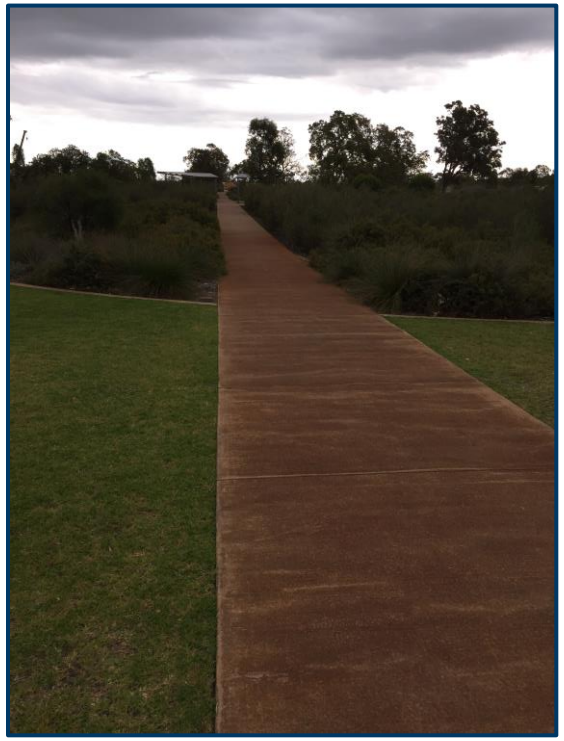
MIX NATURAL MATERIALS INTO URBAN FORM

AND A LOCAL EXAMPLE…. LATERITE



AND A LOCAL EXAMPLE…. LATERITE

PLACE BASED RELATIONSHIPS



- **Geographic, Historical and Ecological connection to place**
- **Use of indigenous materials**
- **Landscape influence on built forms**
- **Integration of culture and ecology**

WATER – EDUCATION -PLAY

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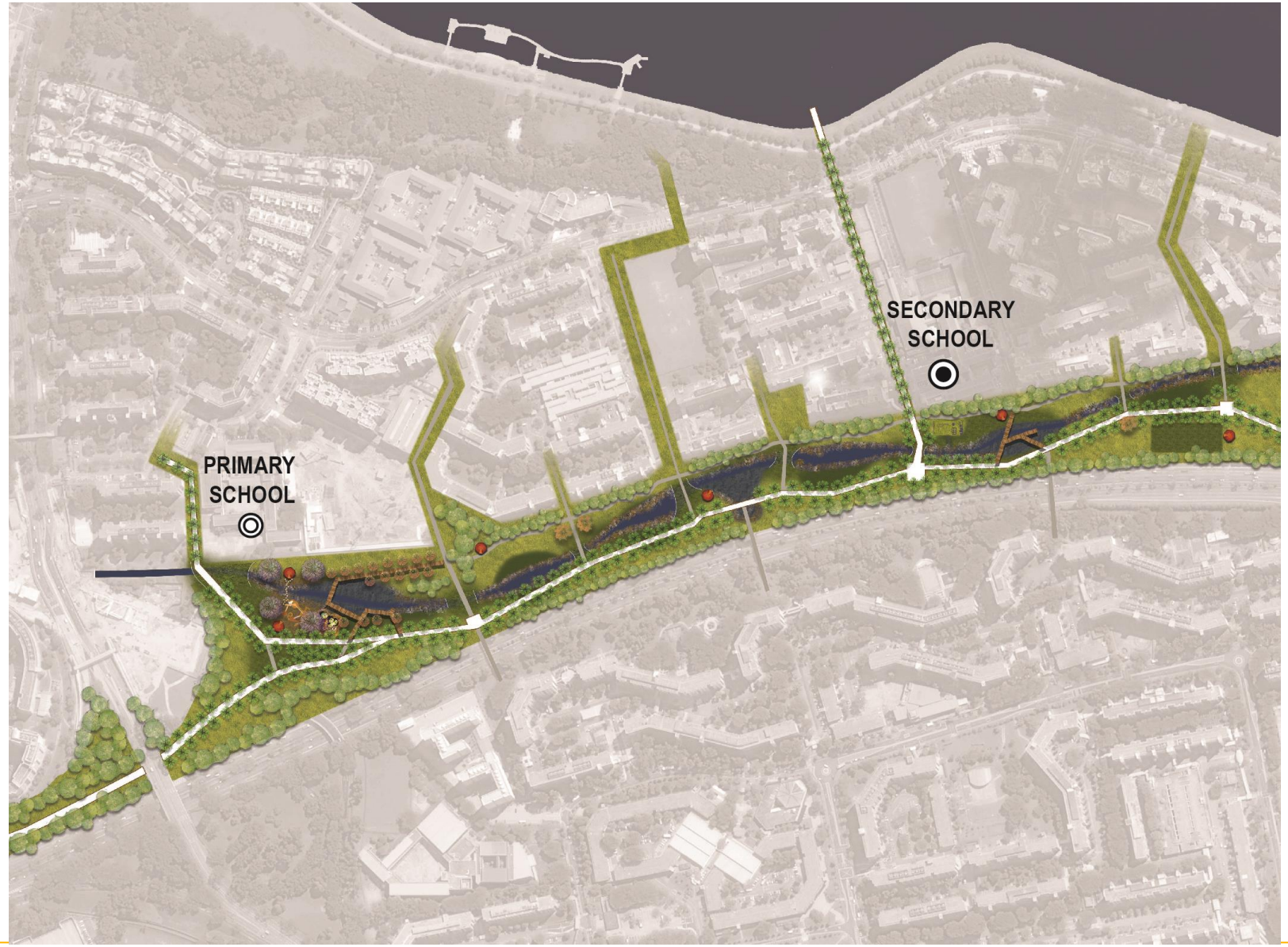

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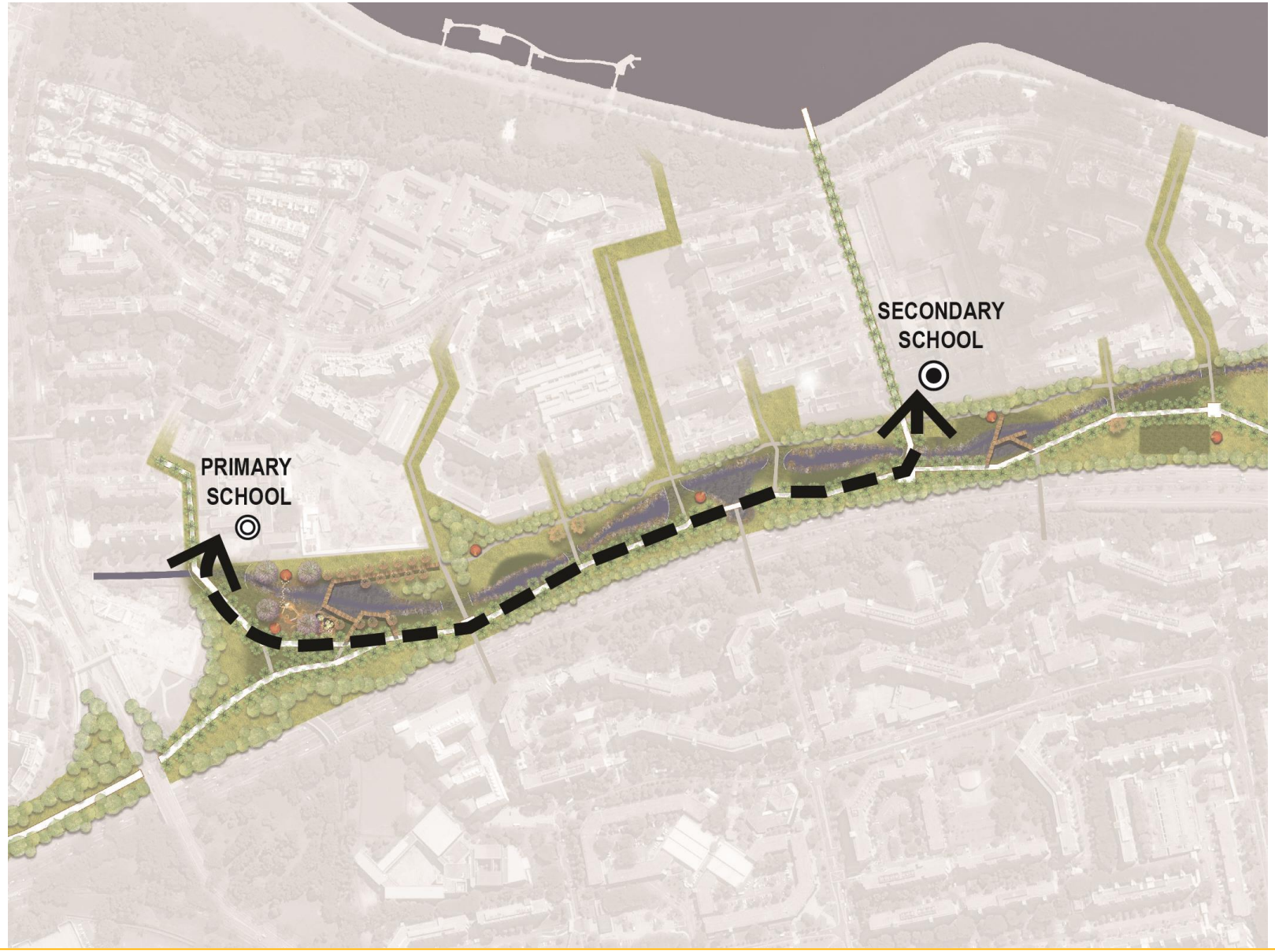

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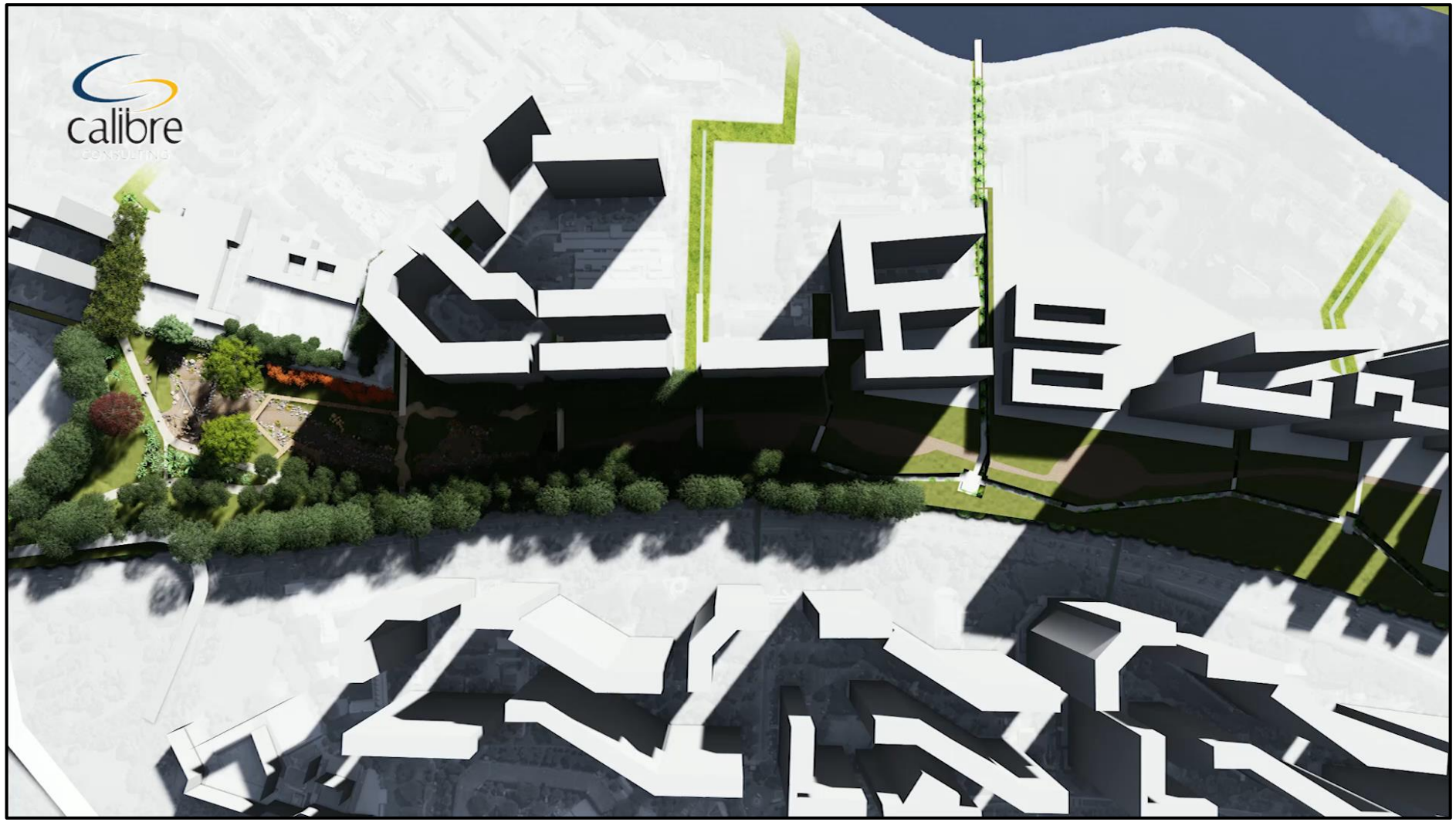

WATER – EDUCATION -PLAY

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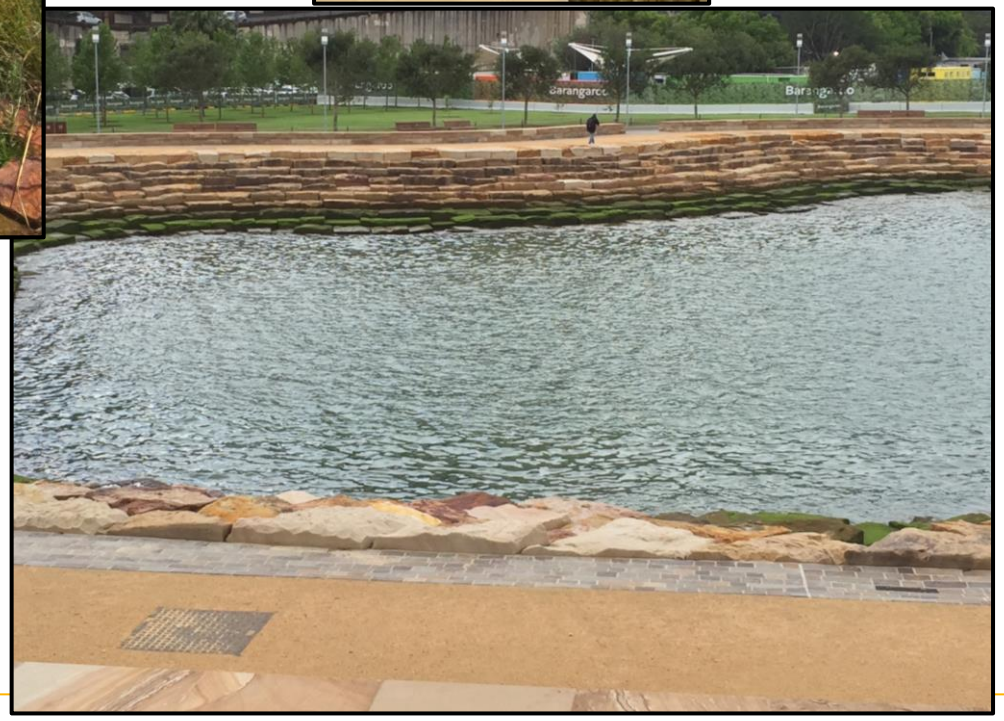
A LOCAL DRAINAGE EXAMPLE -

CONCEPT – A LINK TO WATER

The current situation

CONCEPT – A LINK TO WATER

CONCEPT – A LINK TO WATER



CONCEPT – A LINK TO WATER

IN SUMMARY……

- Biophilic design options can be tailored to current and future sites.
- Provide a better quality lives for the local community while achieving environmental and economic outcomes.
- Well suited to enhancing WSUD in NZ