

從『生態校園』談『生態城市』之建構

Construction of the Eco-city From the Eco-campus



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Introduction

- The space of natural ecosystem is squeezed due to human over-use of the natural.
- The population excessively concentrates on the urban area, and cause the problems of traffic and inhabitancy.
- A large area of impermeable material is used, resulting in poor drainage of the city and caused the temperature rise.
- Rapid industrialization has led to increased environmental pollution.
- Excessive human development has caused a decline in the quality of living environment.

Traffic jam



Air pollution

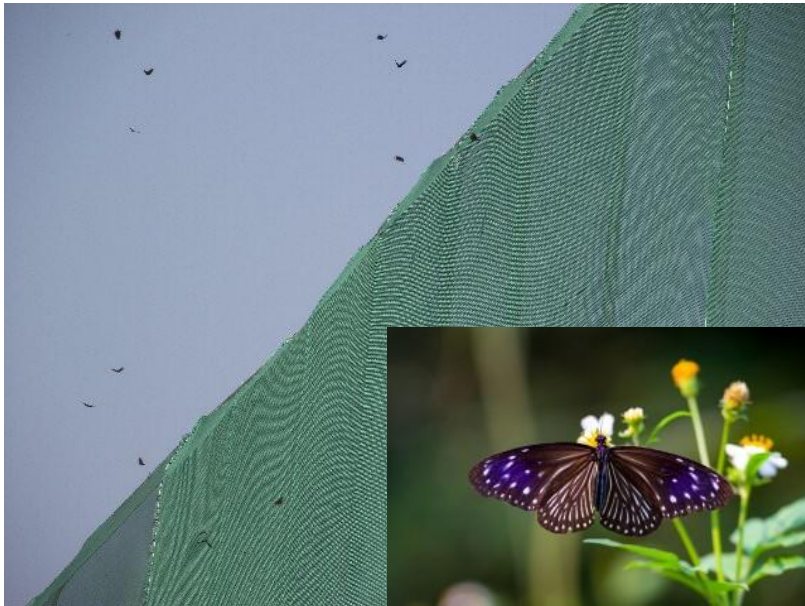


Bad landscape





Ecological calamity



Eco-community development is faced with several problems

- Lack of the public health system
- High population growth caused by crowded living space
- A serious shortage of greening spaces
- Transport caused by air pollution
- Urban heat island effect
- The high cost of land

Concepts of the sustainable eco-community

- Avoid the use of non-renewable
- Improve the effectiveness of energy use
- Effective use of water resources
- Appropriate space allocation
- Materials selected must be naturalized and to avoid over-concretization
- Reasonable allocation of human needs and other biological needs for survival

Build up the NTUT Eco-Campus

- 1994: started to reform the environment in campus
- 2000: project of “Water and Green Environment Planning” induced the concept of Eco-Campus
- 2002: established “Innovative Campus Overall Planning-NTUT Eco-Campus Planning”, which integrate ecologies within the campus
- From 2003, several sub-projects were implemented, including Moat River, Eco-pond, Green House, Bird Island, Green Wall/Gate, Rainfall Reuse, Permeable Pavement, Energy Conservation Improvement.

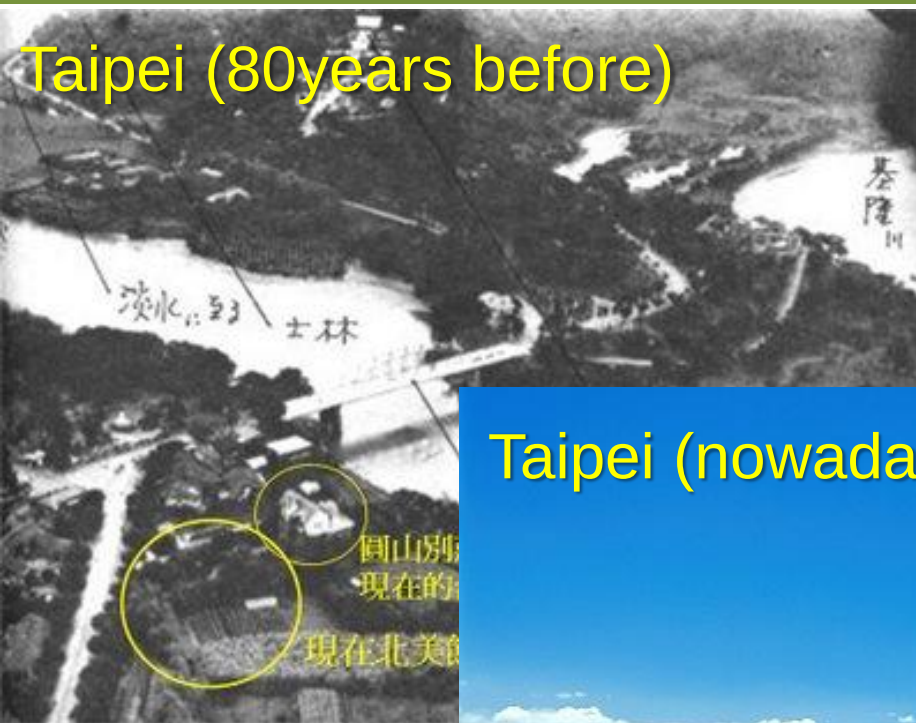
生態校園 (Eco-campus)



生態社區(Eco-community)



生態城市(Eco-city)



<http://tinggardener.blogspot.co>



[L/43952/44384/3734356.html](http://www.taipei.gov.tw/43952/44384/3734356.html)



http://www.flickr.com/photos/sunshine_chuang/1339794251/

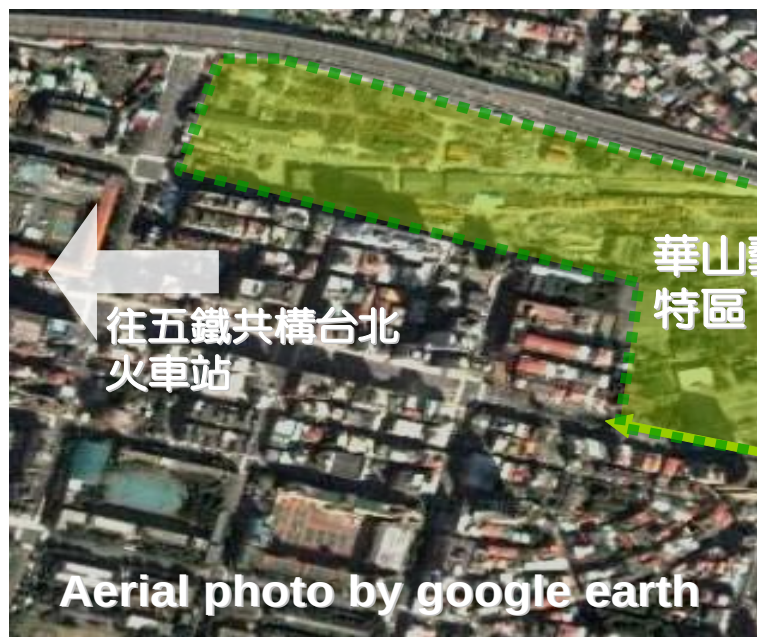
Basic ideas of Eco-Campus(1/2)

- An open eco-campus space must be connected to the urban area through ecological interface.
- As the “gateway to urban ecology,” this project allows urban ecology and landscape to the campus by penetrating its walls and boundaries and makes the eco-campus to expand and encompass the surrounding urban area.



Basic ideas of Eco-Campus(2/2)

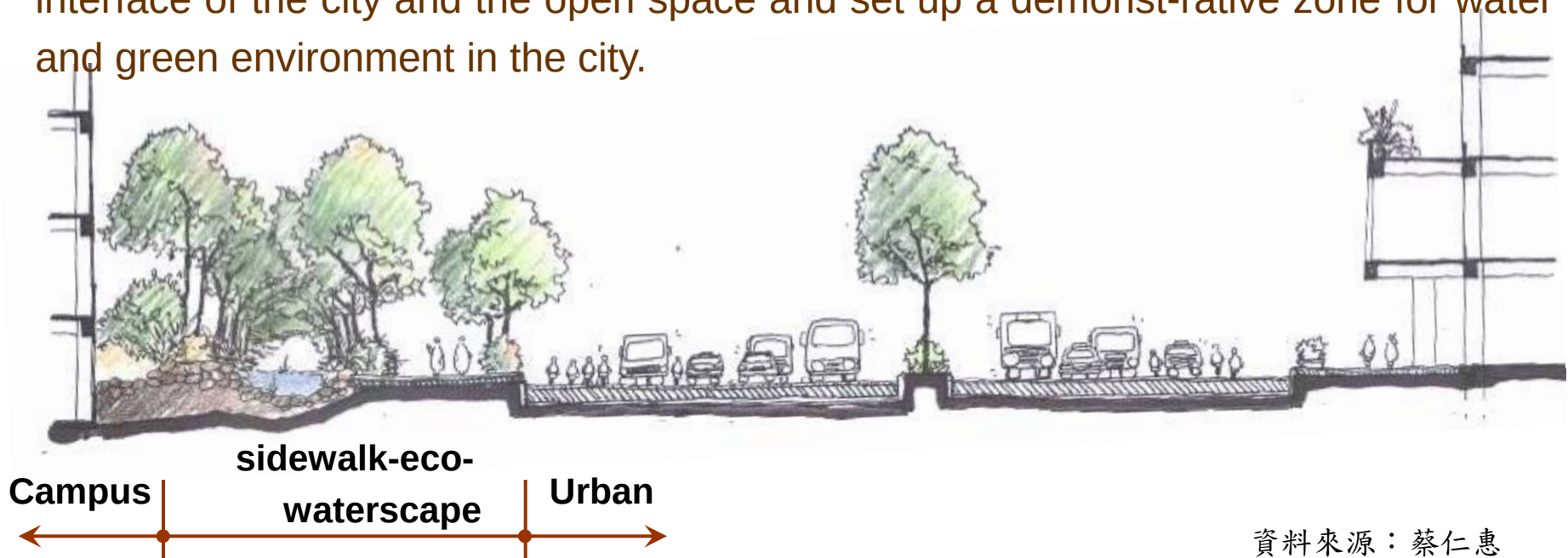
Situated at the heart of downtown Taipei and the nucleus of the transportation network, NTUT is surrounded with major arteries, Near MRT Zhongxiao-Xinsheng Station, it is where MRT Banqiao Line, MRT Muzha Line and MRT Xinzhuang Line meet. Located near the north-west corner of the campus, Guanghua Mall is an important information technology outlet in Taipei City. With Hua-shan Special District for Arts and Jianguo Brewery around, NTUT has become a typical urban campus, a technological, educational and cultural center of the city that demonstrates features of educational and academic endeavors.



資料來源：蔡仁惠

Sidewalk-eco-waterscape (1/2)

In concert with the sidewalk, the area can become an eco-street that demonstrates the image of eco-water-scape, based on which a natural fence takes shape to supplant the regular wall. Besides beautifying Zhong-xiao East Road, the concept turns the existing “side-walk-fence” image into “sidewalk-eco-waterscape” image and establishes a green urban interface that is based on water and green environment. The purpose is to blend natural ecological environment into the interface of the city and the open space and set up a demonstrative zone for water and green environment in the city.



資料來源：蔡仁惠

Sidewalk-eco-waterscape (2/2)



UI Green Metric World University Ranking



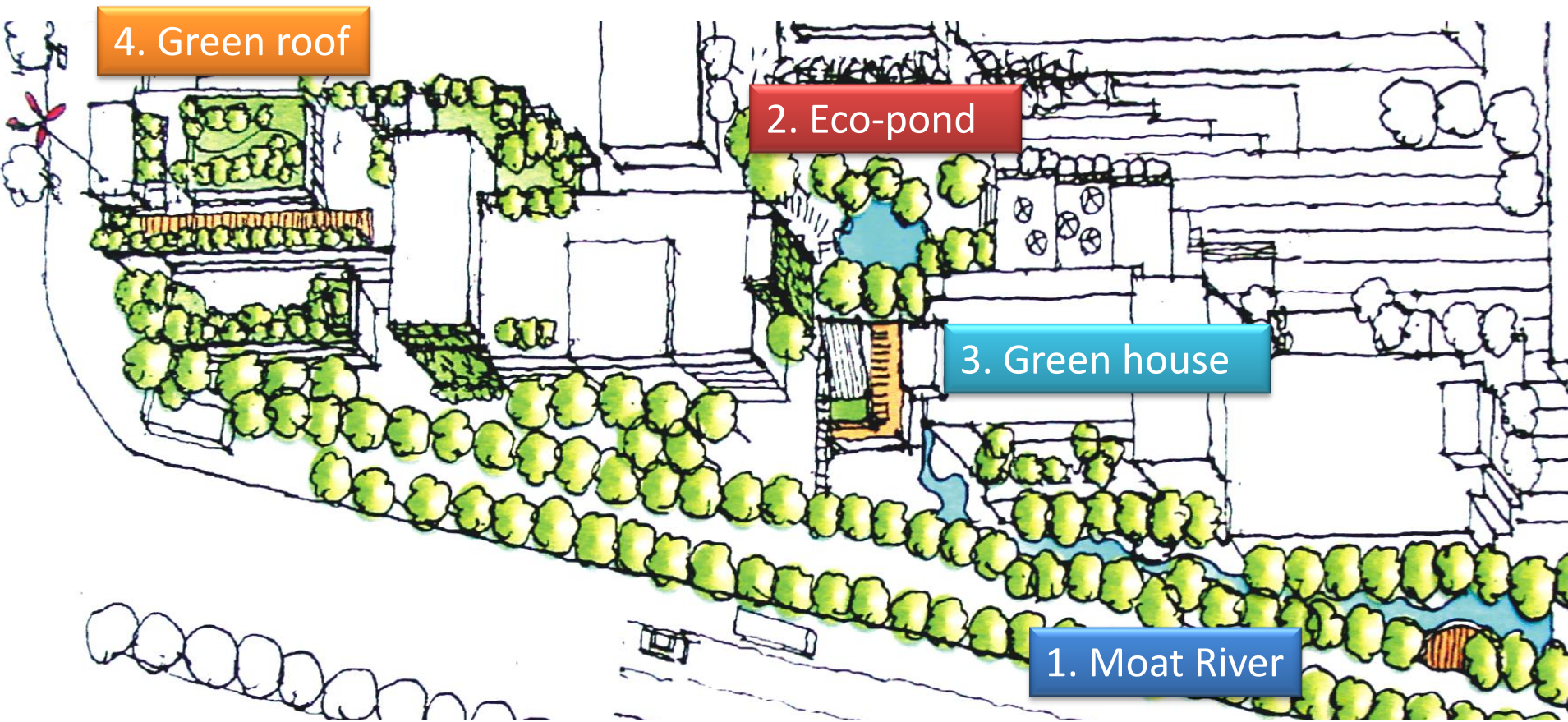
World Ranking 2011

University	Country	Total	Ranking
University of Nottingham	UK	8033.54	1
Northeastern University	US	7981.46	2
University of Connecticut	US	7708.02	3
University College Cork	Ireland	7682.48	4
Linköping University	Sweden	7661.23	5
University of California, Berkeley	US	7601.87	6
University of California, Los Angeles	US	7498.49	7
Washington University In St. Louis	US	7359.69	8
University of California Merced	US	7347.3	9
University of Bath	UK	7341.27	10
University of California, Davis	US	7302.67	11
University of North Carolina, Chapel Hill	US	7266.75	12
Cornell University	US	7257.54	13

University	Country	Total	Ranking
National Taipei University of Technology	Taiwan	7191.68	19

Universiti Putra Malaysia	Malaysia	7204.6	18
National Taipei University of Technology	Taiwan	7191.68	19

Moat river of ZongShaw South Road



1. Moat River (1/8)

Objective:

Breakdown the enclosing wall and build a ecological interface between the campus and the city.

Key concept:

A 80m length of campus wall are transformed to a eco-river, providing a ecological-friendly interface and an aquatic habitat .

Site area: 1403 m².



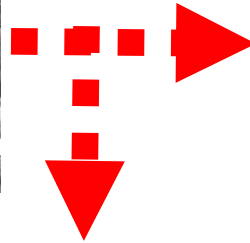
資料來源：蔡仁惠

1. Moat River (2/8)



Before

After



資料來源：蔡仁惠

1. Moat River (3/8)



資料來源：蔡仁惠

1. Moat River (4/8)

1. Friendly Eco-Portal

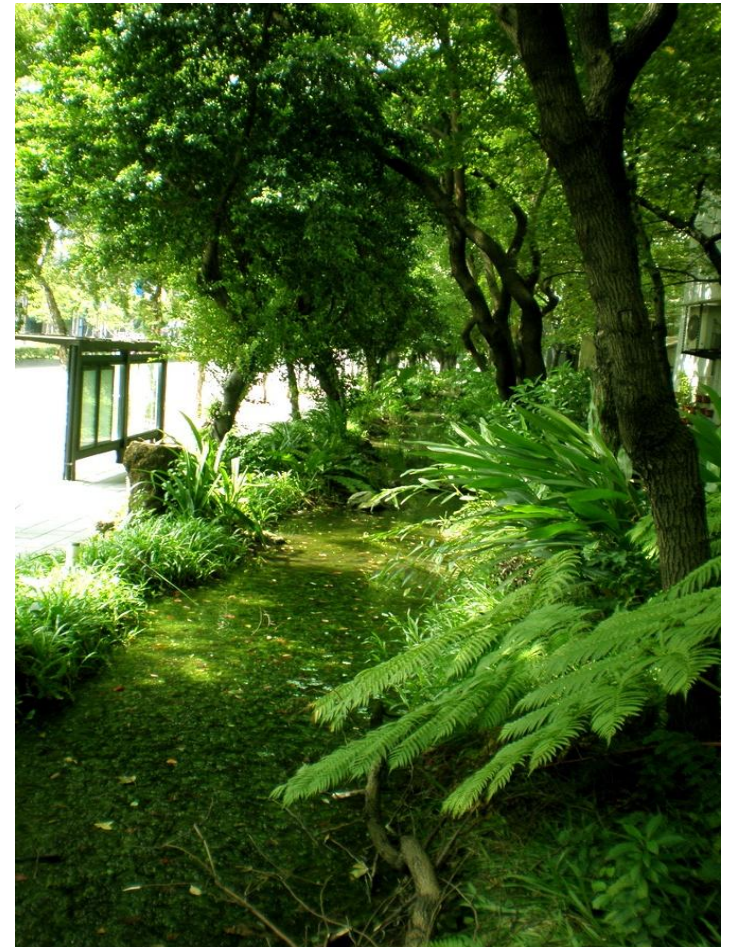


資料來源：蔡仁惠

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1. Moat River (5/8)

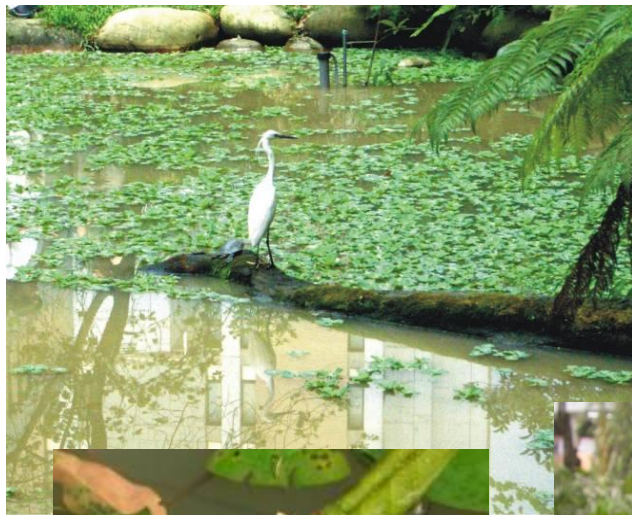
2. Creation- Multi-layer Planting



資料來源：蔡仁惠

1. Moat River (6/8)

3. Ecological Education Site



資料來源：蔡仁惠

1. Moat River (8/8)



http://www.basicinitiative.org/programs/global_communities/sustainable_taiwan.htm

資料來源：蔡仁惠

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2. Eco-pond

Before



Setting up the eco-pond and building the water eco-space could **soften** the campus space. One year after completion of the project, there had been numerous visits of nightingales to the small area of the pond; white egrets also showed up every now and then to **surprise** many.

After



資料來源：蔡仁惠

3. Green House

Objectives:
**Utilizing natural service to build up
a comfortable and zero energy
wasted building.**

Area: 95.5 m².

**The electricity of Green House are
from renewable energy.**

資料來源：蔡仁惠



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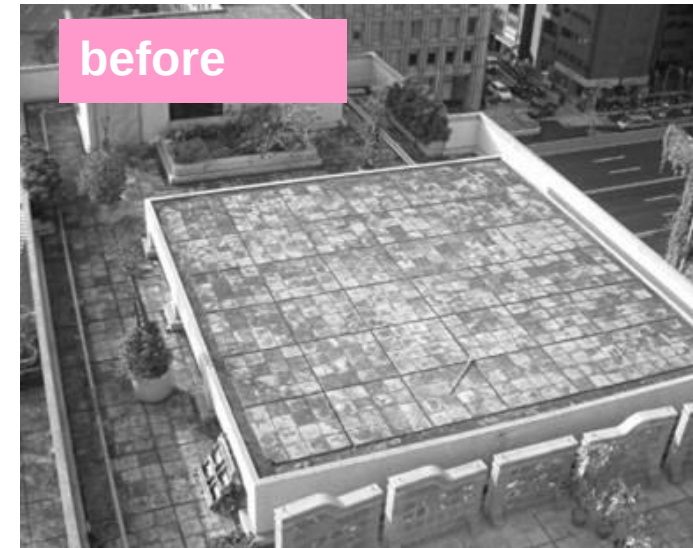
4. Bird Island / Green Roof

Objective:

The building roof becomes a rest place for birds in city.

Location: the Architecture Design Hall

Area: 100 m²



資料來源：蔡仁惠

ShinSeng water ecological space



ShinSeng South Road

1. Green Wall (1/2)



資料來源：蔡仁惠

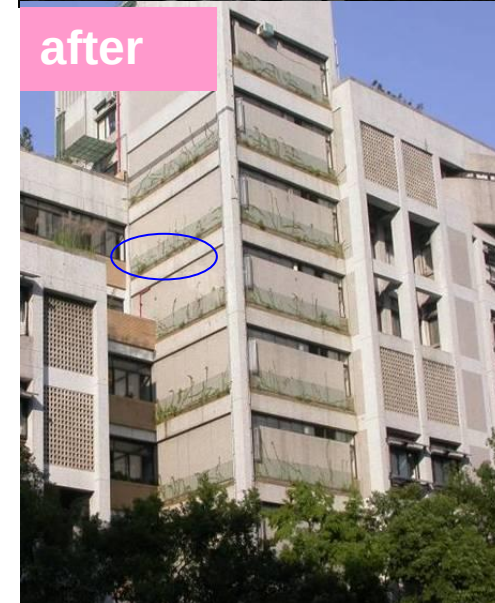
1. Green Wall (2/2)

Objective:

To beautify the appearances of buildings, to reduce the temperature, and to purify air pollution.

Location: the building wall faced to city.

Key concept: using used tap water to water the plants.



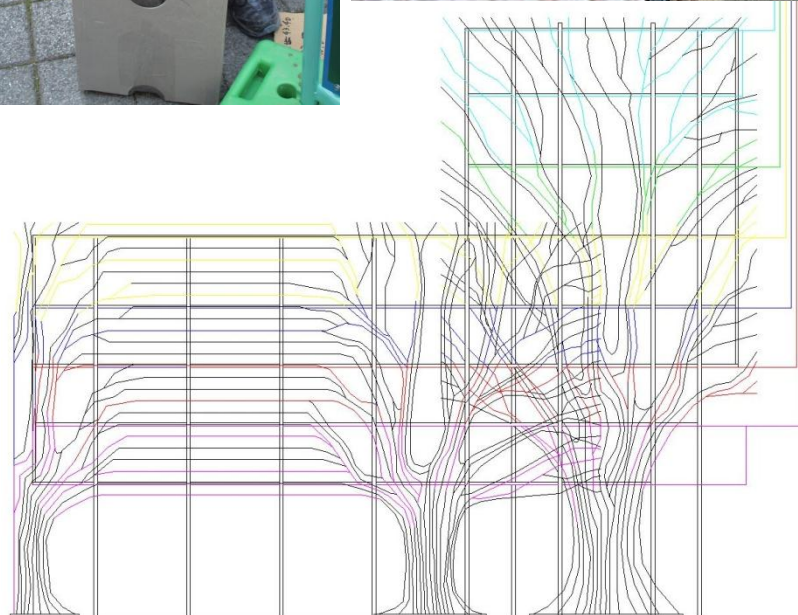
資料來源：蔡仁惠

2. Green gate (1/4)



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2. Green gate (2/4)



2. Green gate (3/4)

➤ 爬牆虎 (*Parthenocissus tricuspidata*)

- Flowering: Feb.-Mar
- Fruiting: Mar - May

➤ 薜荔 (*Ficus pumila*)

- Flowering: Apr. – Jun.
- Fruiting: May – Jul.

➤ 珊瑚籐 (*Antigonon leptopus* Hook)

- Flowering: May – Nov.

➤ 炮仗花 (*Flaming Trumpet*)

- Flowering: Feb. – Mar



2. Green gate (4/4)

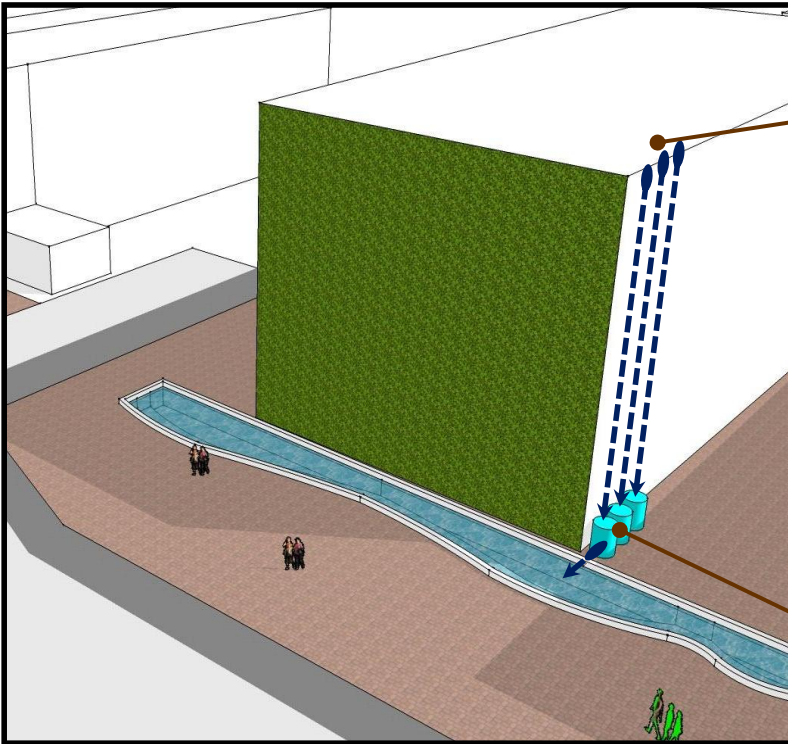


3. ShinSeng eco-river (1/9)



3. ShinSeng eco-river (2/9)

➤ Rainfull Reuse



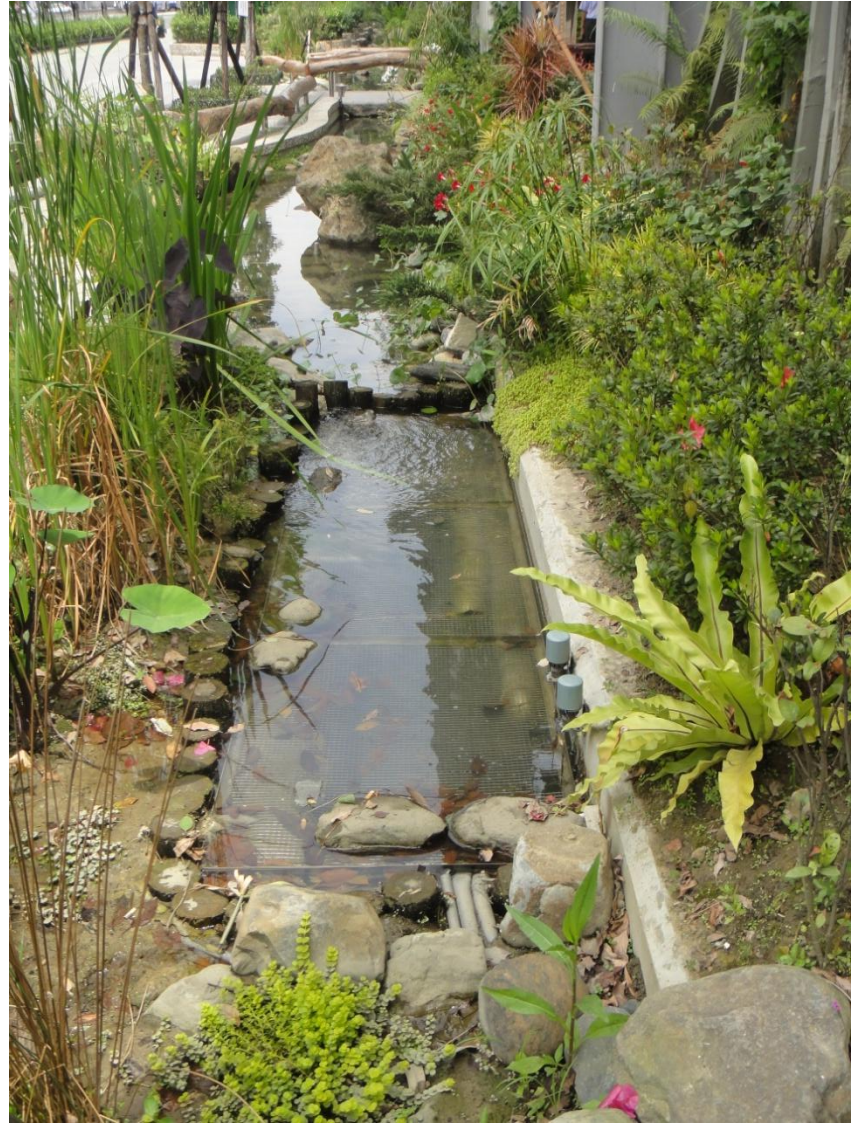
3. ShinSeng eco-river (3/9)



3. ShinSeng eco-river (4/9)



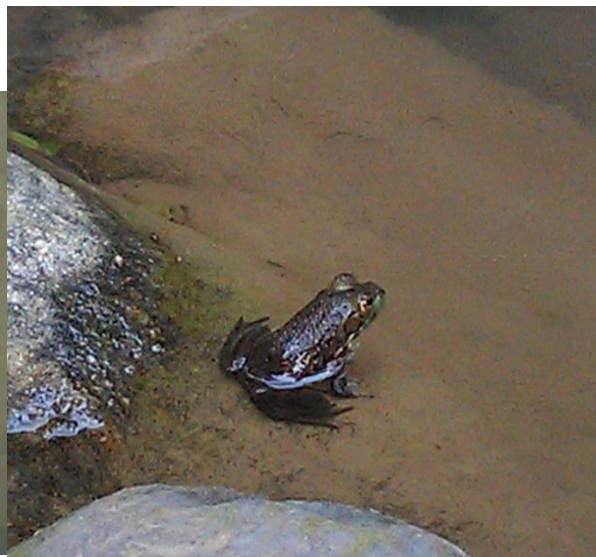
3. ShinSeng eco-river (5/9)



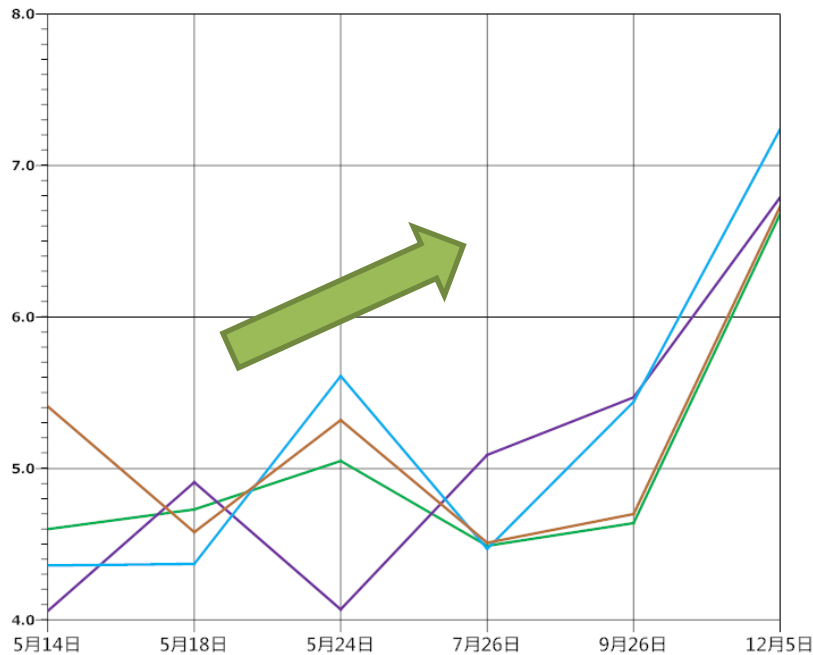
3. ShinSeng eco-river (6/9)



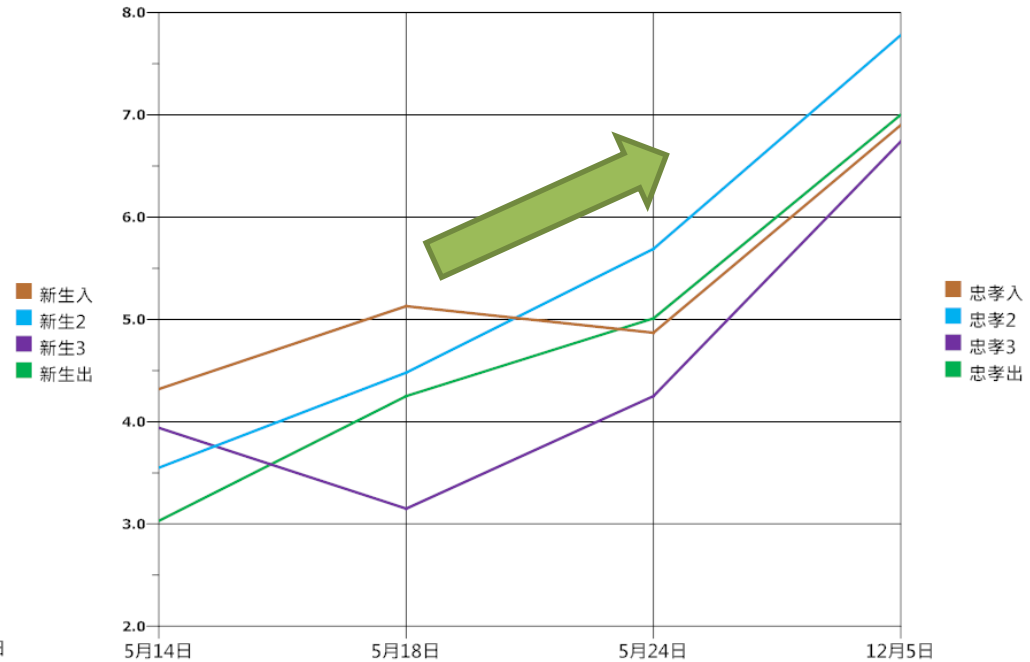
3. ShinSeng eco-river (7/9)



3. ShinSeng eco-river (8/9)

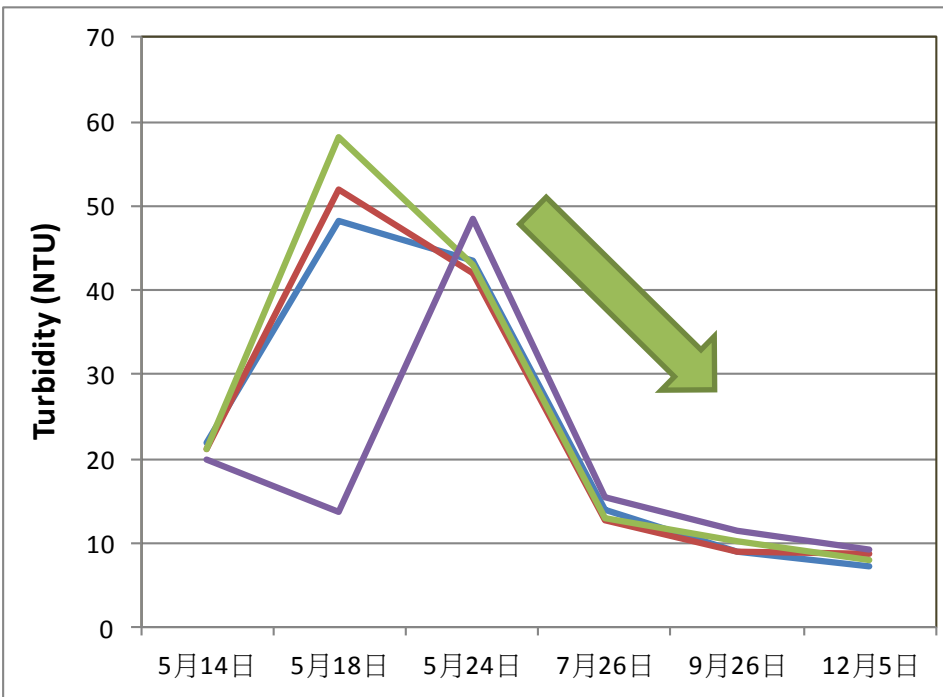


DO (ShinSeng river)

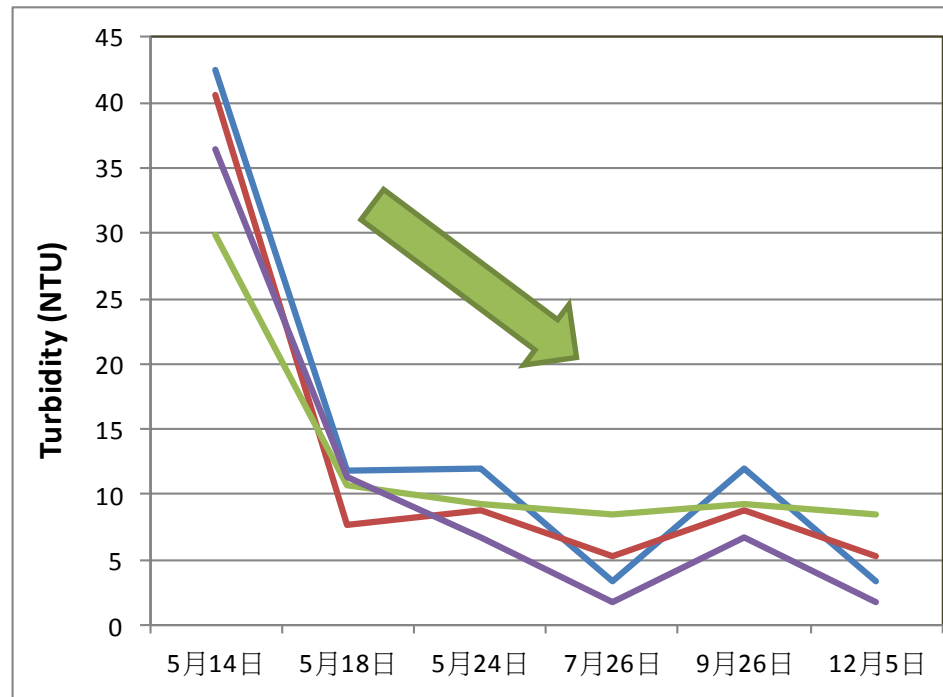


DO (ZongShaw river)

3. ShinSeng eco-river (9/9)

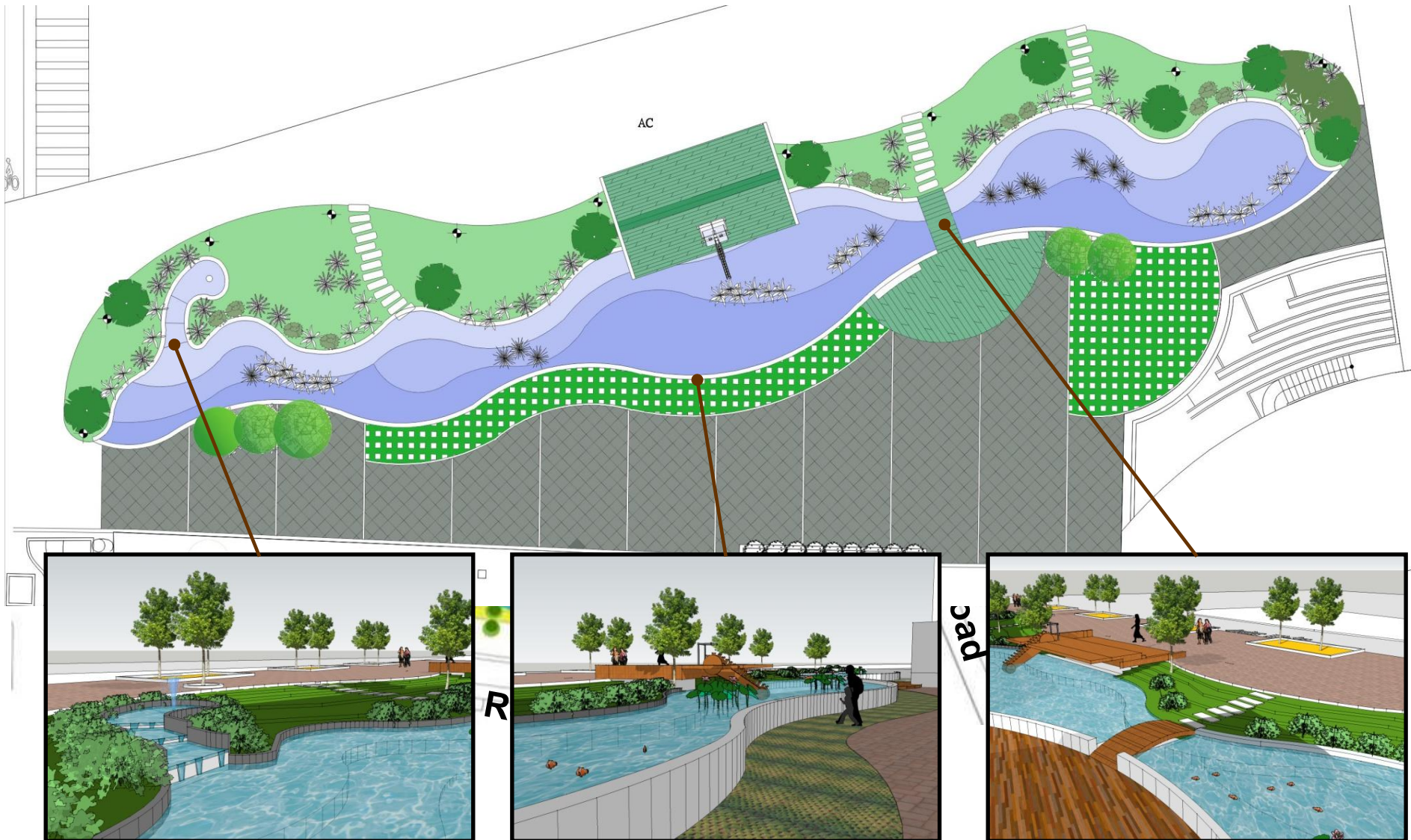


Turbidity (ShinSeng river)



Turbidity (ZongShaw river)

Bade eco-river



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Bade eco-river



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Bade eco-river



Bade eco-river



Low carbon, Green energy and Eco-community

低碳綠能與生態社區



1	綠色材料	Green materials
2	綠色能源	Green energy
3	生態景觀	Eco Scenery
4	環境規劃	Environmental planning
5	綠建築	Green building
6	生態工法	Eco-Technology
7	環境監測	Environmental monitoring
8	資源再生	Resource recycling

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