Fascination

City with rain, play with rain.

First Mentor: Steffen Nijhuis
Second Mentor: Diego Sepulveda Carmona
Examiner: Remon Rooij

Fascination city with rain, play with rain

First Mentor: Steffen Nijhuis
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Site Selection
Problem Statement
Research Question
Serbia isn’t the member of European Union.

Belgrade is located at the confluence of the Sava and Danube rivers.
Site Selection

New Belgrade

Old Belgrade

3rd Belgrade

Zemun
May 17th, 2014
Prepares for flooding, using sand bags

Problem Statement
Waterlogging inside the City

Problem Statement

Source: www.novosti.rs/вести/Београд.491.html#151884-улице-штица-кад-падне-киша
Before 19th century, people don't suffer from the flooding problem.

Old Belgrade and Zemun developed slowly and separately on the higher part of two sides of Sava River.

After 19th century, city began to develop towards river Sava, and people are faced with the waterlog in the low-lying area of the city.

Two separate cities came to be under the same government and city began to expand fast. After WWII, New Belgrade began to drain out the swampy terrain which is a previously uninhabited area on the left bank of Sava River.

City development with emerging rainwater issue.
Problem Statement

1. Need to collect inside the city

Rainwater

Lower part flooding

2. As a seasonal resource to utilize

![Graph showing precipitation and infiltration]

Volume

Month

Problem Statement
Problem Statement

Social Issue——Post-socialist city

- Sleeping City
- Same Configuration
- Dormitory
- Informal building
- Highrise building
- Grand boulevards

Housing for Exploding Population
flat and undesirable public space

- Basic facilities
- Grassland, lack of trees, hard paving
- Monotonous function
- Inside its own block
Potential?

Rainwater

Public Space
Research Question

How to create a resilient, sustainable urban landscape while introducing rainwater as a tool and developing public space of New Belgrade, which improves the livability of the city?

1 How does the rainwater and public space work now?
2 What is the toolbox of integrating rain in urban landscape?
3 How to design a green-blue network in regional scale while providing social, ecological, functional, spatial quality?
4 How does this green-blue network utilize in smaller scale?
Concept
Theory
Case Study
Rainwater Toolbox
New Approach
Vitalizing New Belgrade through Rainwater

Concept: Green--Blue Network
Theory

How to build a Green-Blue network?

1. Landscape is a living system
2. Green-blue infrastructure
3. Urban acupuncture

- Function
- Social process
- Ecological process
- Spatial structure

- Hub
- Linkage

3 urban acupuncture
Case Study

Designed by: Jens Jorritsma
Pendrecht, Rotterdam
Met Water Stad Maken

Design group: Stoss
DETROIT, MI, USA
Blue Green Infrastructure plan - Detroit Future City
Strategic Framework Plan
Typology of Water Retention

- Green Roof / Green Facade
- Underground Cistern
- Rain Barrel / Tank
- Porous Pavement
- Rain Garden
- Open Canal (artificial bank)
- Bioswale
- Water Tower
- Porous Pavement
- Open Gutter Courtyard
- Water Square (fluctuating level)
- Shallow Water / Water Mirror
- Retention Basin (artificial bank)
- Water Playground
- Hollow Road / Open Gutter
- Constructed Wetland
- Natural Swamp and Forest
- Retention Pond (natural bank)
- Nature Reserve / Nature Park
- Stream / Riparian Corridor
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-Constructed Wetland

Water Playground
How to build a Green-Blue network?

Design Framework of Integrating Rainwater into Urban Public Space

1 Creating a Hydrologic Setting

2 Forming the Hierarchy of Open Space

3 Developing a Green Network

4 Identifying Different Waterscape Type

5 Activating Hubs
Context

Rainwater Analysis
Functional Analysis
Social Analysis
Spatial Analysis
Ecological Analysis

Potentials
Because of flat topography and the covering area of the lower part, New Belgrade has more potential to do the rainwater retention.
The soil of new Belgrade is wetter and is associated with marshes and streams. It is more permeable and more suitable for water-loving plants.
Urban green area in old Belgrade is mainly parks, while new Belgrade is lacking of public space in the community but has lots of open space without recreation.

Context ——Lack of Livability

old Belgrade

new Belgrade
New Belgrade has a clear and strict partition of function zoning. The south part is the peri-urban area which is composed of large agriculture land faced with urban sprawl.
Design Scale

Regional Context
- New Belgrade
- South neighbourhood of Belgrade

5-step framework

Middle Scale
- South neighbourhood of Belgrade

Local intervention
Context

Rainwater Analysis

Functional Analysis

Social Analysis

Spatial Analysis

Ecological Analysis

Potentials

1 lower area

2 water storage place

3 available open space
Site Analysis——Rainwater

1 lower area
2 water storage place
3 available open space

large storage place
Site Analysis——Rainwater

1. lower area
2. water storage place
3. available open space
Site Analysis——Rainwater
1 lower area
2 water storage place
3 available open space

areas next to road are lower
next to neighbourhood is lower
The existing rainwater system (underground) in new Belgrade is not enough for store water. It is necessary to find surface area to store water.
The south neighbourhood is lacking in water storage place. While the surface storage in urban area is only fountain and small pond which only has aesthetics meaning but no recreational meaning.
Site Analysis——Rainwater

1 lower area
2 water storage place
3 available open space

Peri-urban area has linear elements of canal and stream which has potential to be widen or utilized as a large storage place.
Site Analysis—Rainwater

1 lower area
2 water storage place
3 available open space
Context
Rainwater Analysis

Functional Analysis
Social Analysis
Spatial Analysis
Ecological Analysis

Potentials
Site Analysis——Functional Aspect

well-done riverfront park
Site Analysis——Functional Aspect

- Green Park
- Brownfield
- Neighbourhood Green
- Green Patch (grass/tree)
- Plaza/Boulevard

- 2 axes
- Linear park structure
- Pedestrian way
The whole new Belgrade is rich in commercial activities and full of job opportunity. And culture and recreational activity is limited indoor, religion and sports activities.
Site Analysis—Social Aspect

main attractions and destination outside
quiet and peaceful neighbourhood
Site Analysis——Social Aspect

"Blokovi" Neighbourhood 89561 population

"The Sunny Community" ("Naselje Sunca")

- socio-economically mixed
- retired army
- intellectual
- artist
- children
- old people
- elite
Site Analysis——Social Aspect

People’s Initiative
1 Hub: main functional area is along road
2 Sub Hub: go to center; go to main street and inside (retails)
3 Go outside
Site Analysis——Spatial Aspect
Connection

sudden stop
Site Analysis — Spatial Aspect

A-Section

B-Section

2 main roads
middle road: wide and no trees
Site Analysis——Spatial Aspect

Connection

north: miss bicycle connection
dike
Site Analysis——Spatial Aspect

Space Character

Block 45,70
potential hub:
functional building and link to exiting parks
green area attraction with basketball field
half-enclosed building, only benches
Site Analysis——Spatial Aspect
Space Character
Site Analysis—Spatial Aspect

Space Character

Block 70A
Site Analysis—Spatial Aspect

Space Character

Block 61, 62, 63, 64

Potential hub:
Share a public park in the middle and next to functional buildings
Kindergarten and school
Site Analysis——Spatial Aspect

Space Character

Block 71, 72
Site Analysis——Ecological Aspect

- farmland
- wet forest
- trees & shrubs & orchards

biggest ecological benefit: plants type
next to main road and could be connected
lack of trees even less shrubs

No shrubs

Green Patch
Brownfield

Site Analysis——Ecological Aspect
green way
connect the orchard in peri-urban as corridor
Context
Rainwater Analysis
Functional Analysis
Social Analysis
Spatial Analysis
Ecological Analysis

Potentials
Potentials

Functional

Social

Spatial

Ecological
1 Creating a Hydrologic Setting
2 Forming the Hierarchy of Public Space
3 Developing a Green Network
4 Identifying Different Waterscape Type
5 Activating Hubs
Design Process & Principles

1 Creating a Hydrologic Setting
Design Process

Large Storage Place

On-site Dispersed Catchment Basin
Design Process

1. Creating a hydrologic setting

- Stormwater Boullevard
- Wet Buffer Next to Main Road
Design Process & Principles

1. Creating a Hydrologic Setting

2. Forming the Hierarchy of Public Space
Design Process

2 Forming the Hierarchy of Public Space
Design Process

2 Forming the Hierarchy of Public Space

neighbourhood public space

local public space
Design Process & Principles

1. Creating a Hydrologic Setting

2. Forming the Hierarchy of Public Space

3. Developing a Green Network
Design Process

Tree Lines

More Trees and Shrubs on the Grass
Design Process

Blur Boundary of Street and Function Area

Bicycle Connection
Design Process

3 Developing a Green Network
Design Process
Design Process & Principles

1. Creating a Hydrologic Setting

2. Forming the Hierarchy of Public Space

3. Developing a Green Network

4. Identifying Different Waterscape Type
Design Process

Based on Existing Physical Condition

Different Hub with Different Toolbox
1. Creating a Hydrologic Setting
2. Forming the Hierarchy of Public Space
3. Developing a Green Network
4. Identifying Different Waterscape Types
5. Activating Hubs
Design Process

Provide Conditions for People Social Life

Utilize Water for Other Use

5 Activating Hubs
Outlook

Regional Context

New Belgrade

5-step framework

Middle Scale

South neighbourhood of Belgrade

Local intervention

P2

Elaborated design (Bloko Neighbourhood)

P3

3 representative hubs

P4

publication

P5