



— Belgrade 2026 —

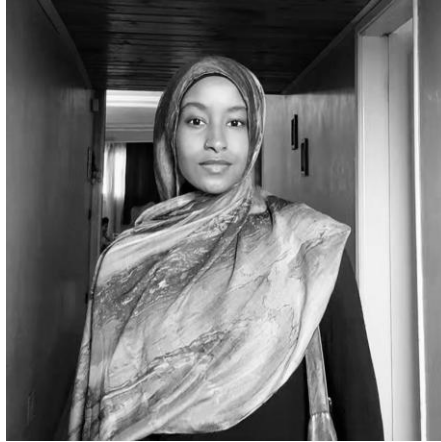


# Conflux

TEAM 32541

# MEMBERS BOARD

---



**Team leader**  
Yagin Ibrahim



**Team Member**  
Yasmeen Nasser

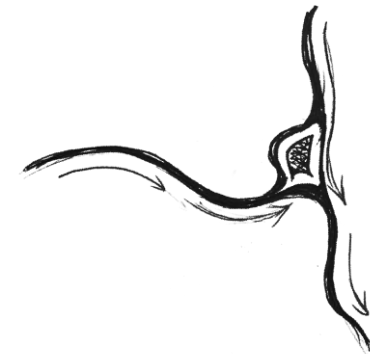


**Team Member**  
Yasmeen Yasser



**Teacher**  
Prof. Dr. Mohsen Abounaga

## CONFLUX



# Summary

Context (Pre-Design) .....	04
Concept and Connection .....	11
Zone A .....	20
Zone B .....	38
Link .....	45





# Pre-Design

# Historical Background

## Belgrade (THE White City)

- Belgrade was named from the Slavic word “Beograd”, meaning the “White City.”
- The name came from the white stone walls of the historic Belgrade Fortress (Kalemegdan), which overlooked the Danube and Sava rivers.
- The fortress was rebuilt by several empires, including the Roman, Byzantine, Ottoman, and Austrian empires, and today it remains one of Belgrade’s most important landmarks.



*Image's credit and source: George M. Groutas, Wikipedia*

# Layers of Cultural and Social Daily Life

## Pygmy Cormorant

A natural scene that reflects the ecological rhythm and presence of wildlife along the water edges



## Traditional cottage

A vernacular architectural typology based on local materials, compact forms, and climatic responsiveness.



## Hungarian Architecture

An urban architectural influence expressed through ornamented facades, proportions, and historic street character.



## Cafés

An important element of Serbian urban culture and daily public life



## White Stone

A natural scene that reflects the ecological rhythm and presence of wildlife along the water edges



## Narodna muzika

A cultural layer that activates public spaces and reinforces collective social identity



## Cycling

A common mode of movement within Serbian riverside cities and urban waterfronts.



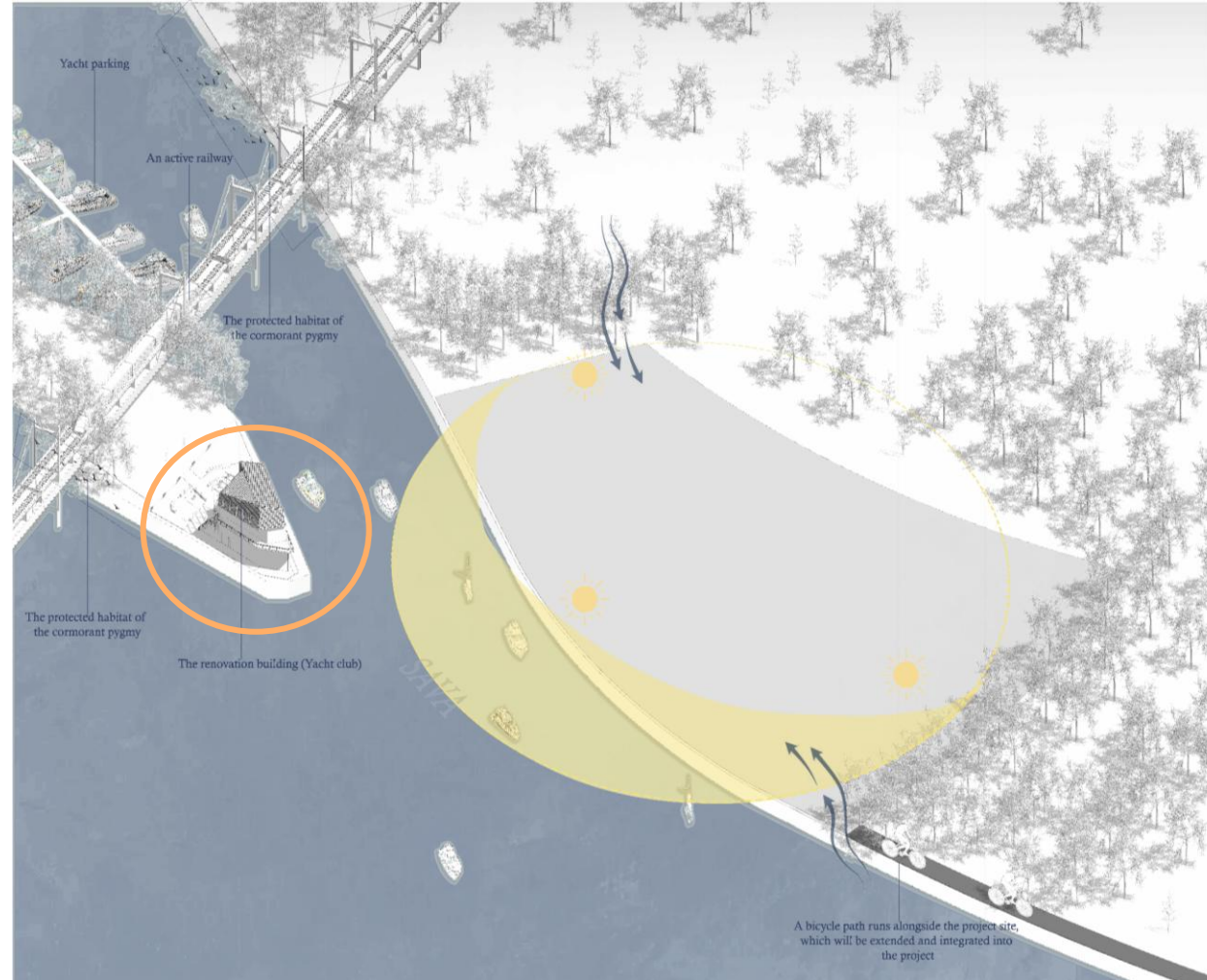
Images' credit and source: Wikimedia

# Site Analysis

## Belgrade, Serbia

Belgrade has a windy climate, and harsh winters coupled with significant rainfall that require our architectural solutions to ensure

- effective wind protection
- satisfactory thermal comfort
- better water management
- climate adaptation from severe events such as storms and flash floods.



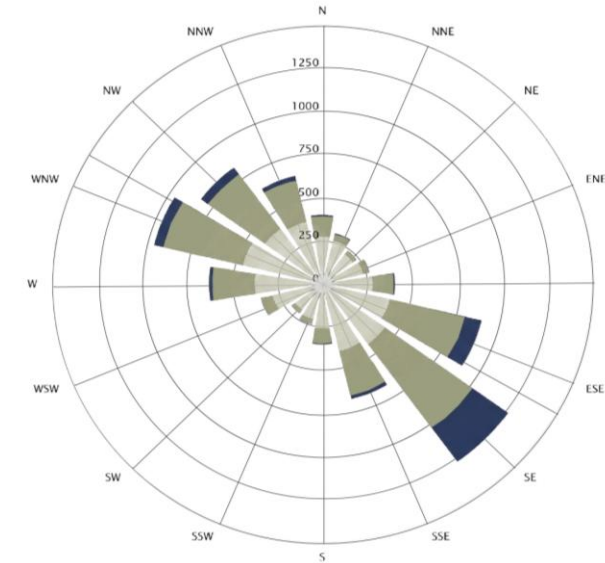
*Image source: developed by the authors*

# Climate Analysis

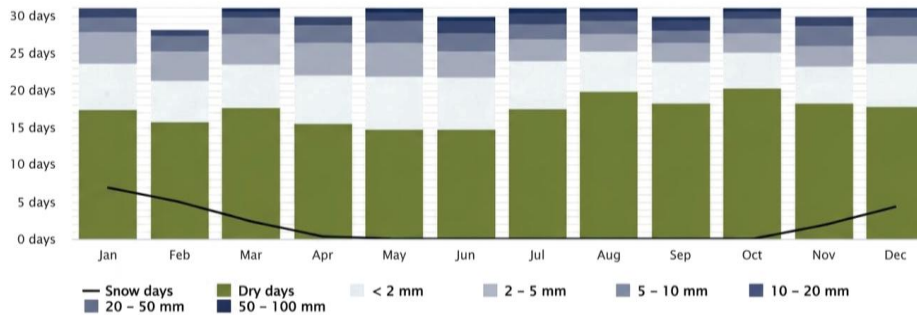


## Belgrade, Serbia

- Climate data in Belgrade reveals cold winters and consistent rainfall, informing design strategies for insulation, weather protection, and efficient drainage.

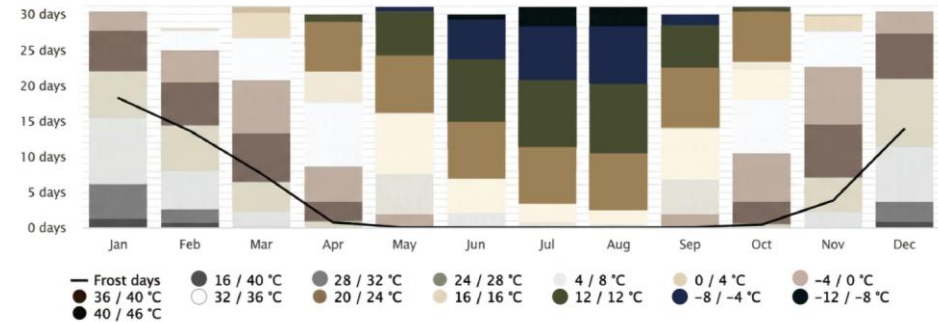


Wind rose



## Precipitation amounts

Images' source: developed by the authors

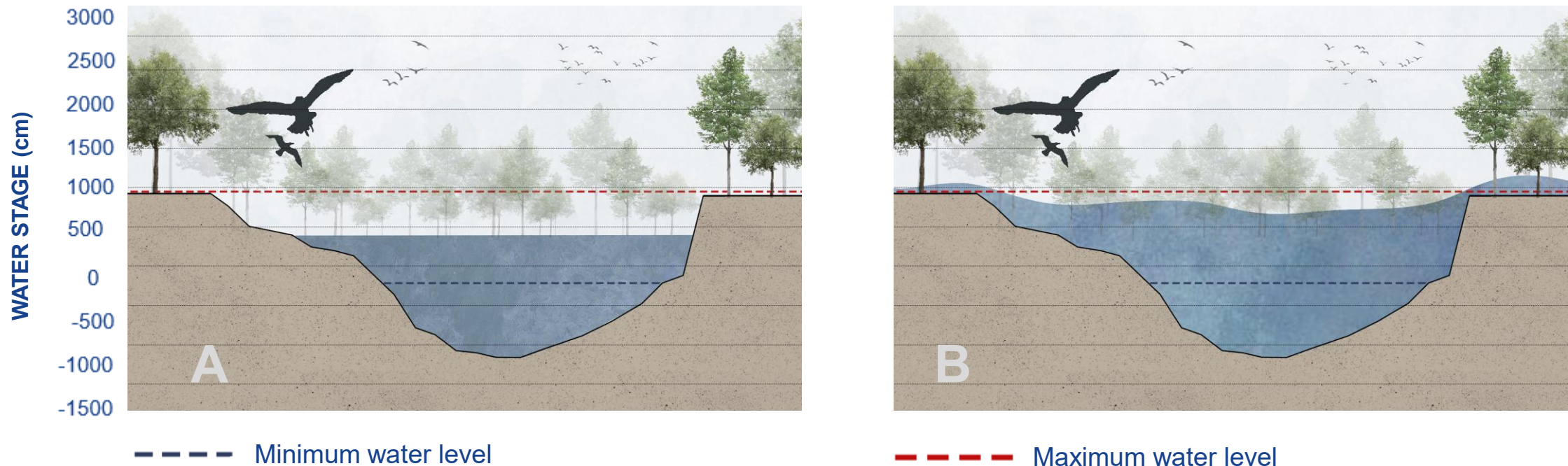


## Air temperature

# Climate Analysis

## Sava River flood Data 1972-2025

Floods are common in the Sava River area, and there is an early warning system in place.  
Sava – Belgrade: the first flood alert begins at **500 cm**, and the second at **600 cm**.



*Images' source: developed by the authors*

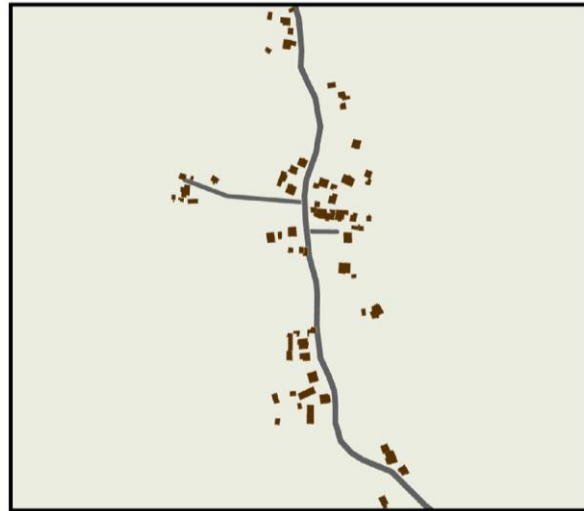
# Urban Analysis

## River



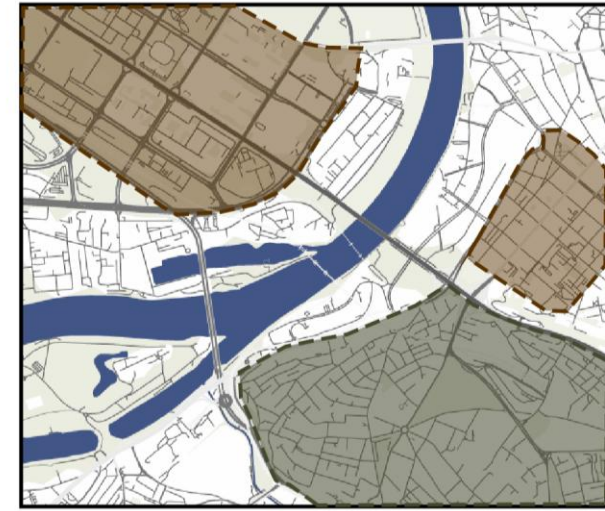
■ Danube River ■ Sava river

## Village Layout



■ Village's houses

## Urban Fabric



■ New urban Fabric ■ Old urban fabric

- The urban contacts in Belgrade served as the initial spark for developing the concept, as will be reflected in our project.

*Images' source: developed by the authors*

# Site's Ecology (National bird)

## Microcarbo Pygmeus

- The Pygmy Cormorant is a small wetland bird that lives near rivers, lakes, and marshes. It is important because it contributes to the balance of the aquatic ecosystem and reflects the health of its natural habitat.



(a) Microcarbo Pygmeus

Image's credit and source: (a) and (b) developed by the authors.



■ The protected habitat at of the cormorant pygmy

(b) The protected habitat of the pygmy cormorant

# Site's Ecology (National bird)



- The willow tree serves as the bird's primary habitat



- It spends most of its time perched on river tree branches to hunt



- It constructs its nests using tree branches, twigs, and any materials it can find

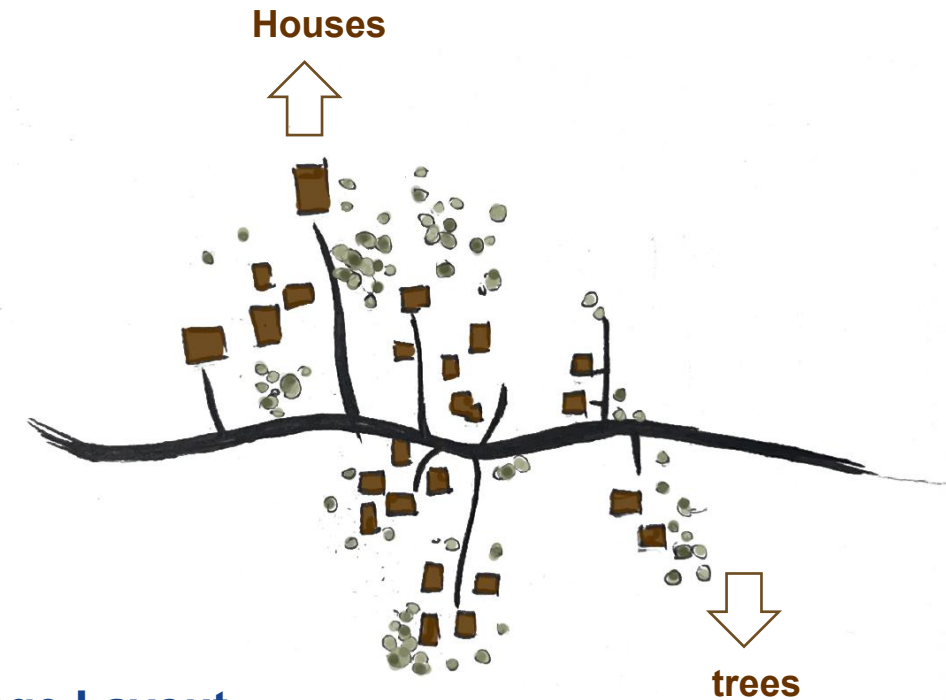
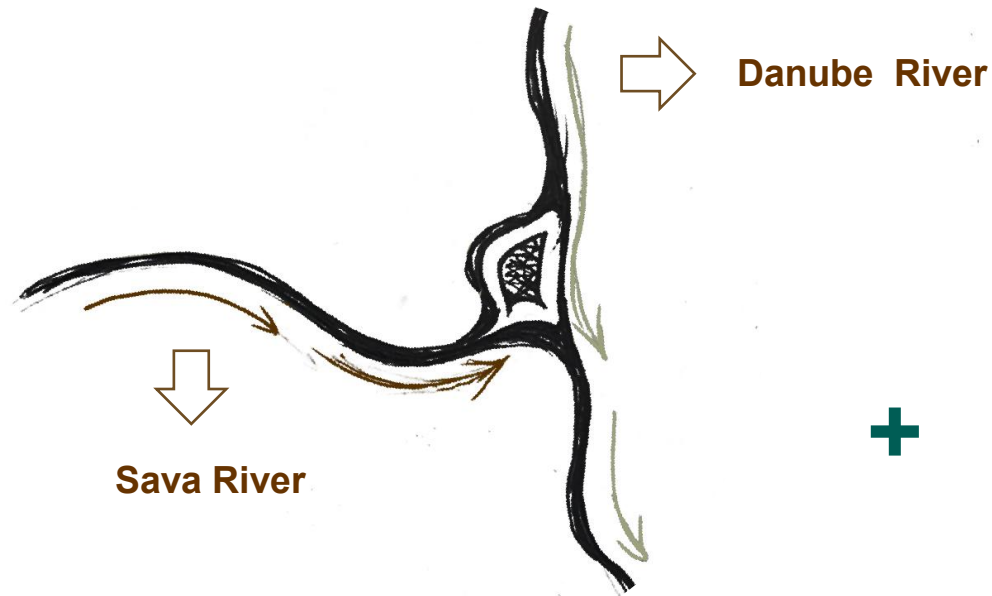


*Images' source: developed by the authors*



# Concept & Connection

# Concept Development



## Confluence of the Danube and Sava rivers

- The meeting point of the Danube and Sava rivers inspired the project's main spatial spine.
- This flowing axis organizes circulation, movement, and connections across the site.
- The design translates the natural flow of water into an architectural and urban experience.

## Village Layout

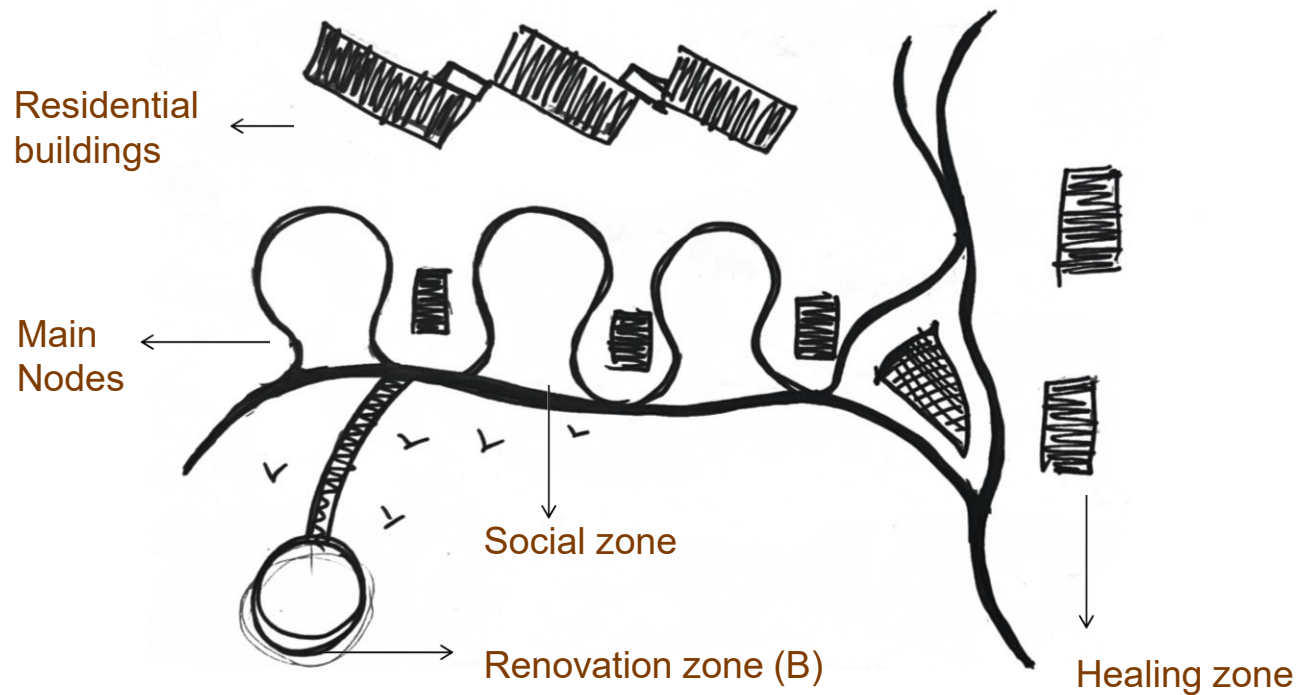
- The project adopts the human scale and spatial logic of rural villages.
- Open spaces and pathways encourage social interaction and community gathering.
- The integration of landscape strengthens the relationship between users and nature.
- The planning approach also supports climate adaptation and environmental responsiveness.

*Images' source: developed by the authors*

# Concept

## A Conflux

The confluence of the two rivers acts as the main spine of the project, from which all services and functions are distributed.



Image's source: developed by the authors

## Urban Expansion Scenarios



Short-term Growth



Long-term Growth



# Zone A

# Layout



← Zone A



Zone B →

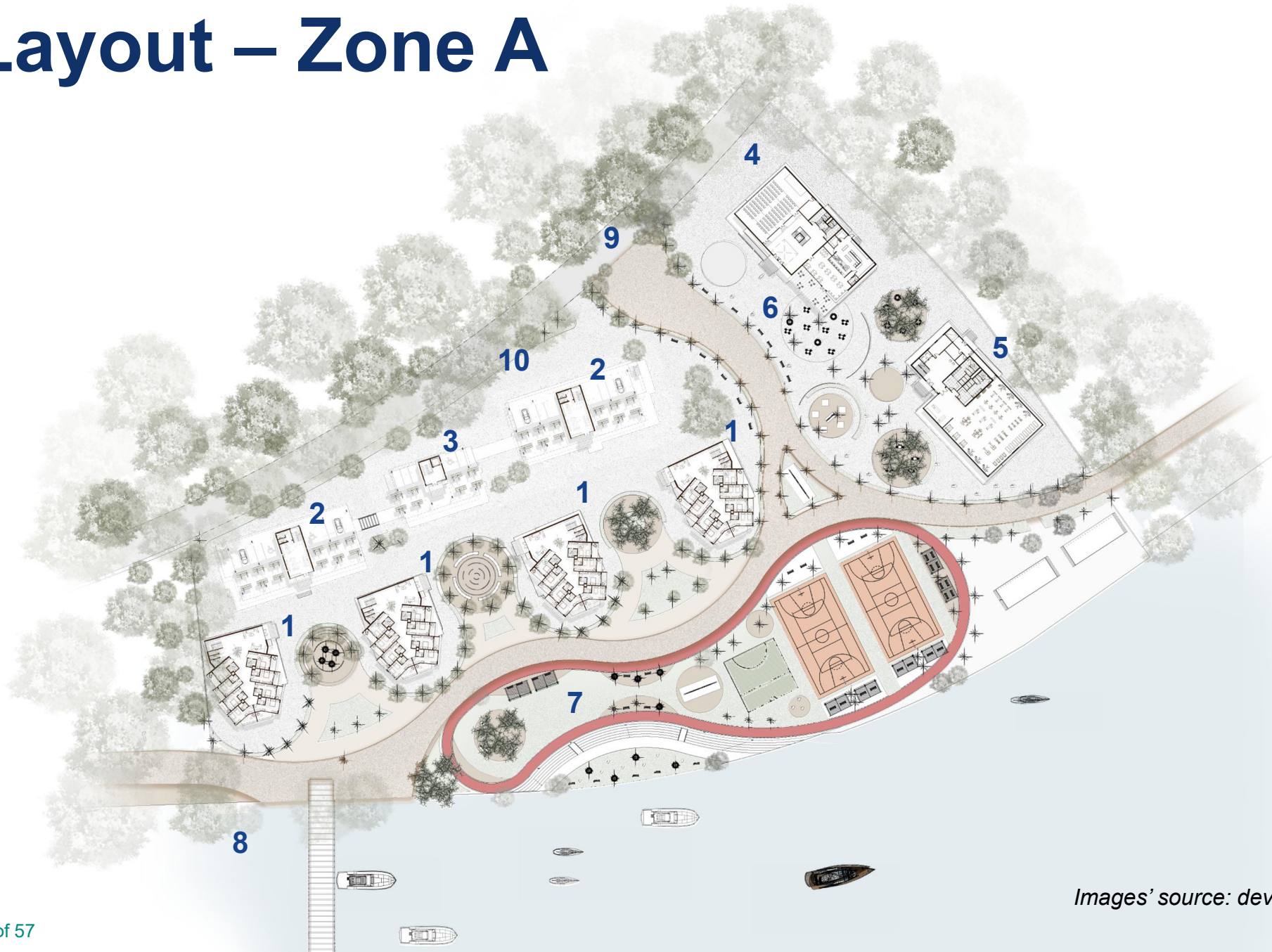
*Images' source: developed by the authors*



# Bird's-eye view of the project



# Layout – Zone A



## Building's Legend

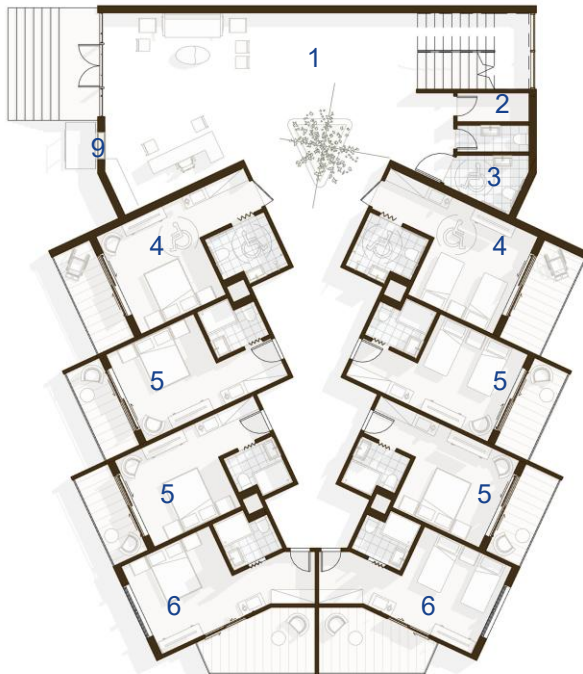
- 1 Accommodation Type 1
- 2 Accommodation Type 2
- 3 Laundry & Services
- 4 Activity Centre
- 5 Recovery Centre
- 6 Seating Area
- 7 Sports Area
- 8 Bridge
- 9 Main Entrance
- 10 Parking

# Accommodation – Type 1

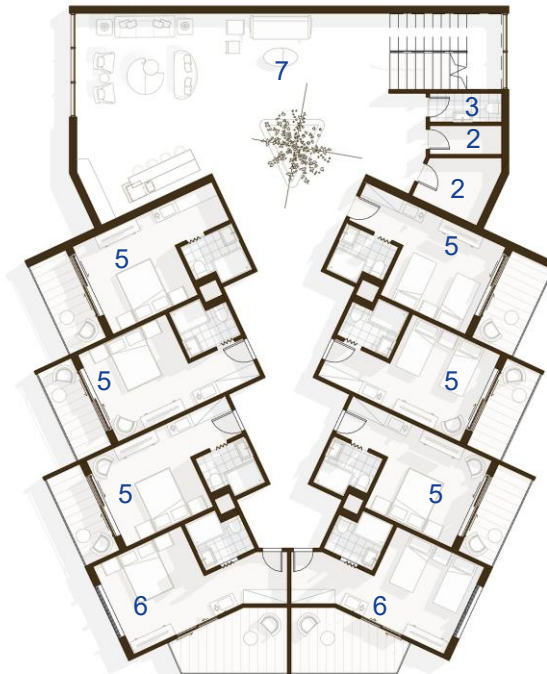
## River View

### Building's Legend

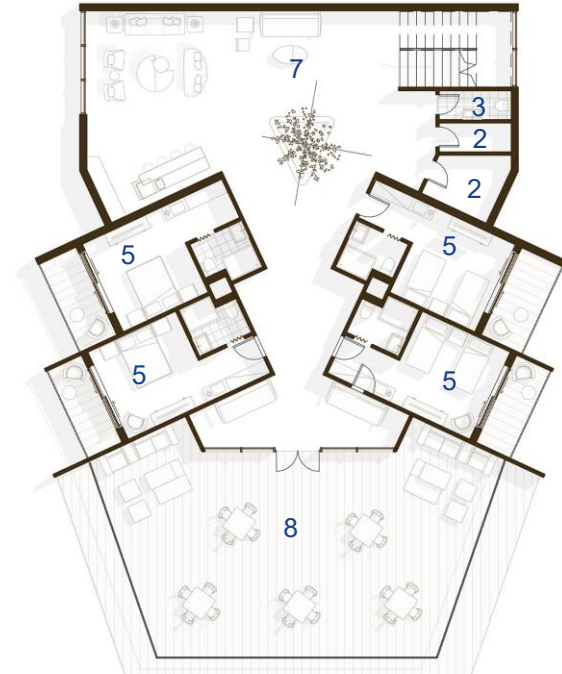
- |                   |                      |
|-------------------|----------------------|
| 1 Entrance Lounge | 6 Room Type 5 Double |
| 2 Storage         | 7 Gathering Area     |
| 3 Laundry Service | 8 Bathrooms          |
| 4 Room Type 4     | 9 Lift               |
| 5 Room Type 1     |                      |



Ground Floor Plan



First Floor Plan



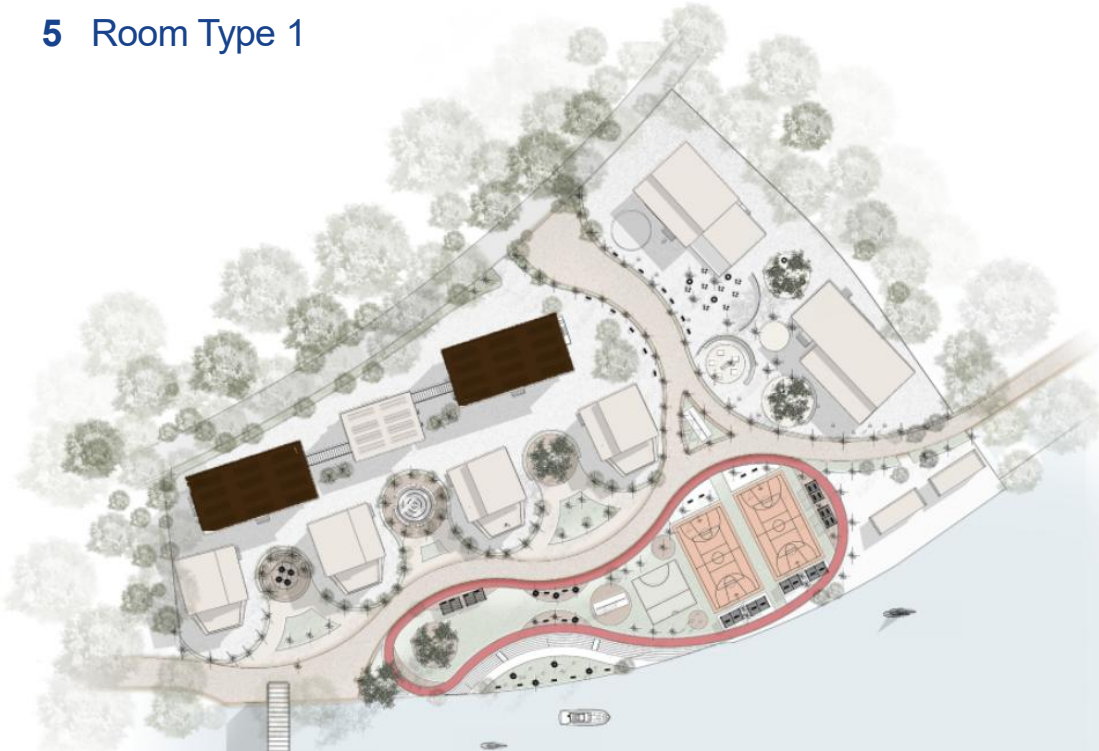
Second Floor Plan

# Accommodation – Type 2

## River View

### Buildings' Legend

- |                   |                      |
|-------------------|----------------------|
| 1 Entrance Lounge | 6 Room Type 5 Double |
| 2 Storage         | 7 Gathering Area     |
| 3 Laundry Service | 8 Bathrooms          |
| 4 Room Type 4     | 9 Lift               |
| 5 Room Type 1     |                      |



Images' source: developed by the authors



Ground Floor Plan



Second Floor Plan



Third Floor Plan



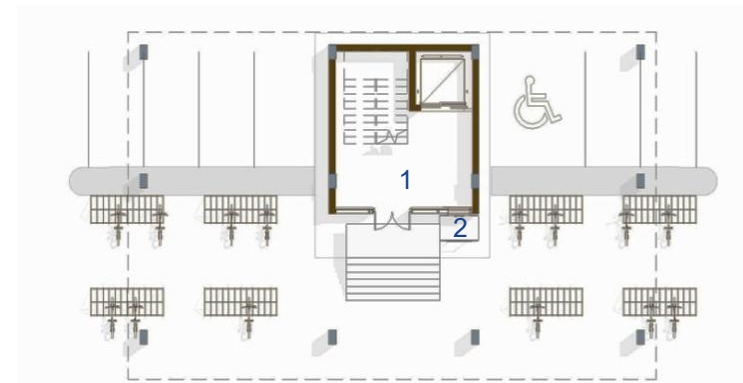
# Laundry & Services

## Building's Legend

- |                       |                           |
|-----------------------|---------------------------|
| 1 Entrance Lobby      | 9 Ironing Zone (Visitors) |
| 2 Lift                | 10 Waiting Area           |
| 3 Stuff Social Space  | 11 Storage                |
| 4 Changing Room       | 12 Laundry (Stuff)        |
| 5 Service             | 13 Ironing Zone (Stuff)   |
| 6 Room                | 14 Toilets                |
| 7 Stuss Room          | 15 Link                   |
| 8 Laundry (Visitors ) |                           |



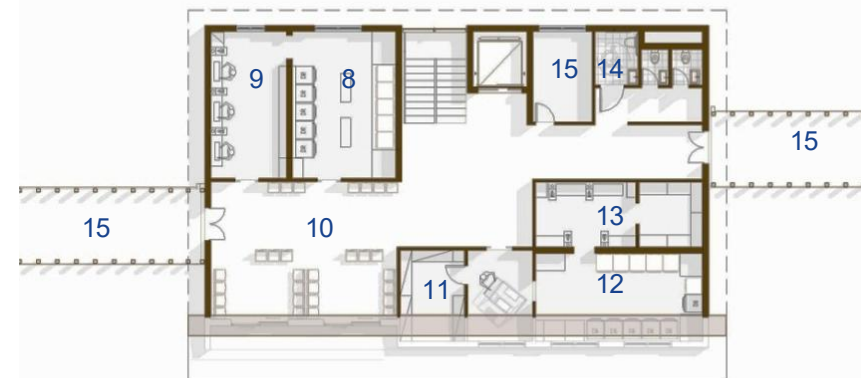
Images' source: developed by the authors



Ground Floor Plan



First Floor Plan



Second Floor Plan



# Recovery Centre

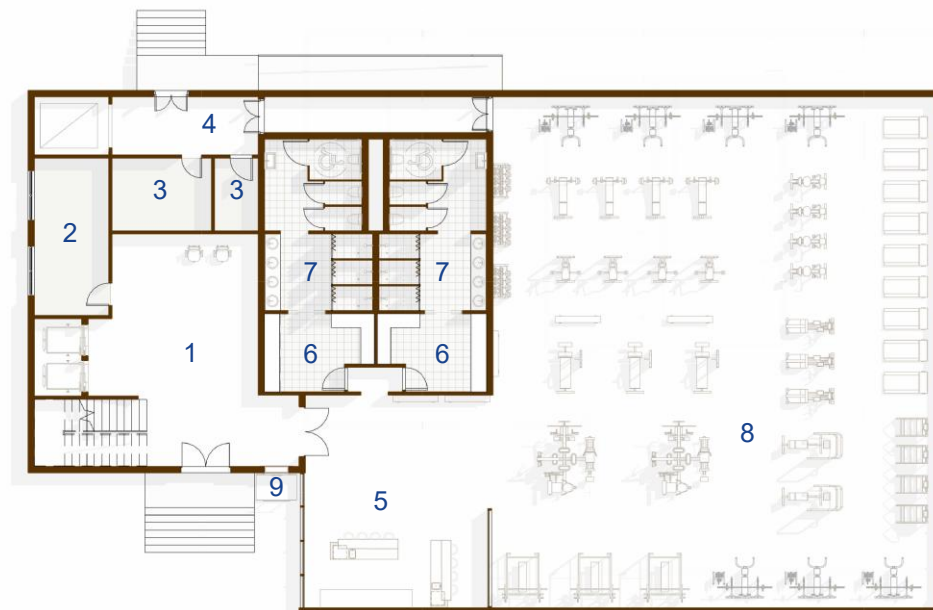


## Building Key (Ground)

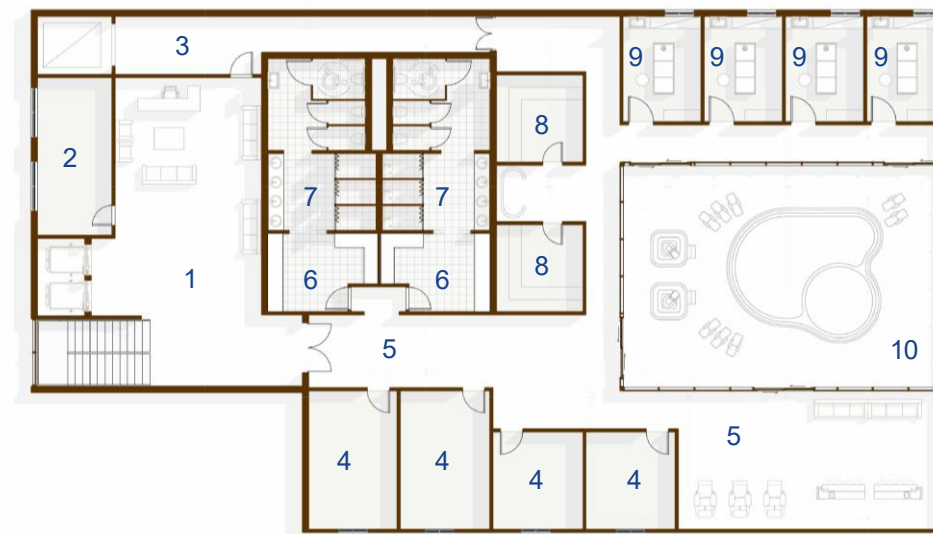
- 1 Entrance Lobby
- 2 Clinic
- 3 Service
- 4 Service Entrance
- 5 Bar
- 6 Changing Room
- 7 Shower & Toilets
- 8 Gym Hall
- 9 Lift

## Building Key (First)

- 1 Lounge
- 2 Offices
- 3 Service Path
- 4 Clinics
- 5 Seating Area
- 6 Changing Room
- 7 Shower & Toilets
- 8 Sauna
- 9 Massage Room
- 10 Jacuzzi & Ice path



Ground Floor Plan



First Floor Plan



Images' source: developed by the authors

# Activity Centre

## Building Key (Ground)

- 1 Entrance Lobby
- 2 Multi Use Hall
- 3 Storage
- 4 Bathrooms
- 5 Dining Area
- 6 Kitchen
- 7 Fridge
- 8 Outdoor Seating
- 9 Lift

## Building Key (First)

- 1 Lounge
- 2 Coworking Space
- 3 Service Path
- 4 Bathroom



Images' source: developed by the authors



Ground Floor Plan



First Floor Plan

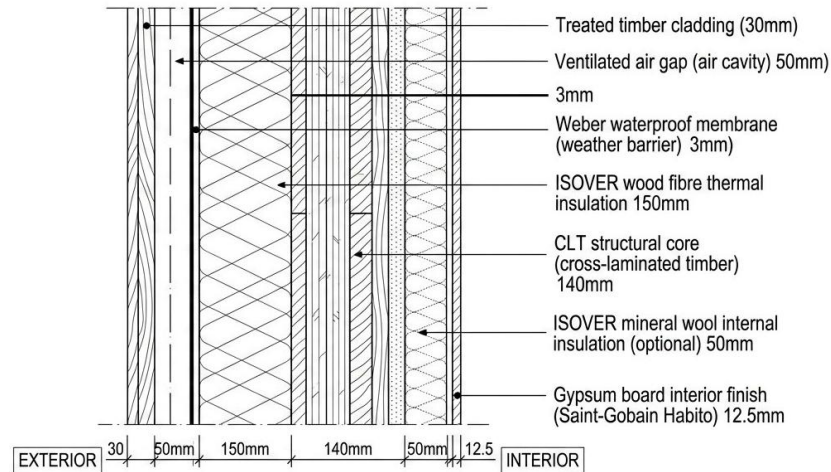


# Accommodation

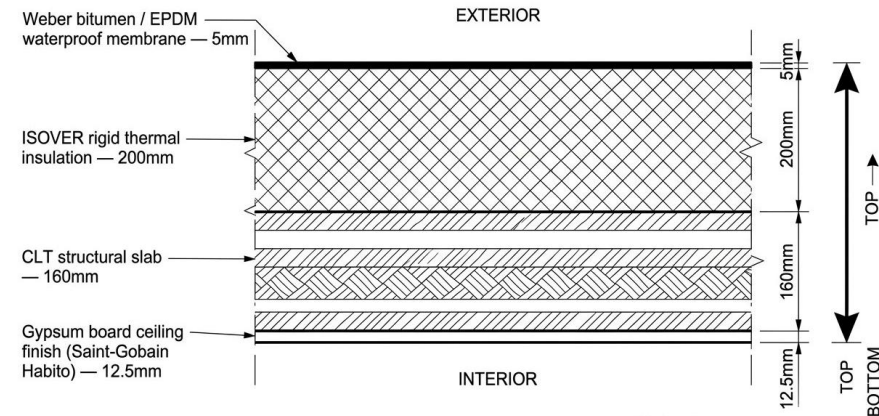


Inspired by the confluence of the Danube and Sava rivers near the site, the project translates this major natural flow into a primary spatial spine that organizes movement and connections. This is complemented by the logic of rural village planning.

### Wall Assembly & Low-carbon Materials



### Roof Assembly & Waterproofing System

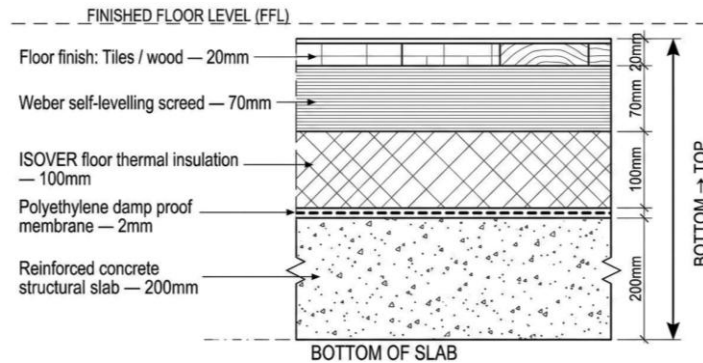


- The wall system combines a ventilated timber façade with high-performance insulation and a CLT structural core, achieving low embodied carbon and high thermal efficiency.



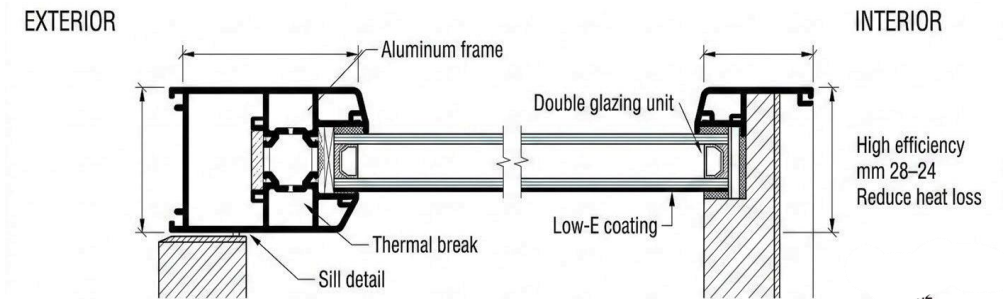
Images' source: developed by the authors based on Saint-Gobain

### Energy- Efficient Wall System



- The wall system combines a ventilated timber façade with high-performance insulation and a CLT structural core, achieving low embodied carbon and high thermal efficiency.

### Energy- Efficient Glazing System



- Double-glazed aluminum system with thermal performance optimization



Images' source: developed by the authors based on Saint-Gobain

# Room Types



Type 1



Type 2



Type 3



Type 4

All units are designed with high flexibility to accommodate both single and double layouts comfortably, while strictly adhering to international architectural standards.

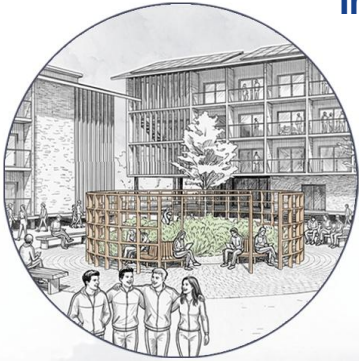
# View from the rooms



# Interior Living Space



# Master Longitudinal Section of the Project



### Interactive Hub

Dynamic seating integrated with nature for a fun social experience.



### Memorial Walls

A display wall documenting athletes' achievements and event highlights.



### Landmark Memory Tree

A symbolic focal point for preserving photos and shared memories.



# Recovery Building – illustrative section

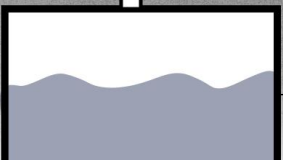


Skylights allows natural lighting and ventilation.

Water collecting system

Wooden lofts to block out strong sunlight and allow ventilation

The confluence of the two rivers acts as the main spine of the project



water collecting system

Image's source: developed by the authors.



# Recovery zone

The recovery zone is designed as a restorative space within the athletes' hub, supporting both physical and mental well-being. Located along the waterfront, it combines activities such as yoga, fitness, spa, and jacuzzi spaces within a calm natural setting, allowing athletes to recover, relax, and reconnect with nature after intense training and performance.

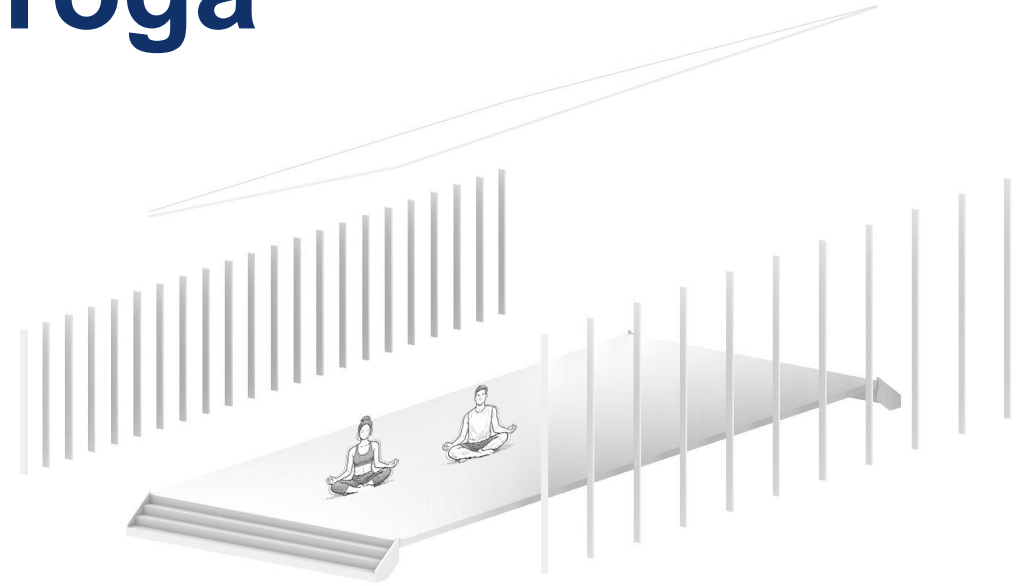


*Image's source: developed by the authors.*

# Meditation Deck



## Yoga



- Designed as a calm open-air relaxation space that encourages users to slow down, gather, meditate, and or practice light wellness activities while remaining visually and physically connected to the river landscape.

*Image's source: developed by the authors.*

# Gym Hall, Sport Zone



*Image's source: developed by the authors.*

# Sports' Zone





# Zone B

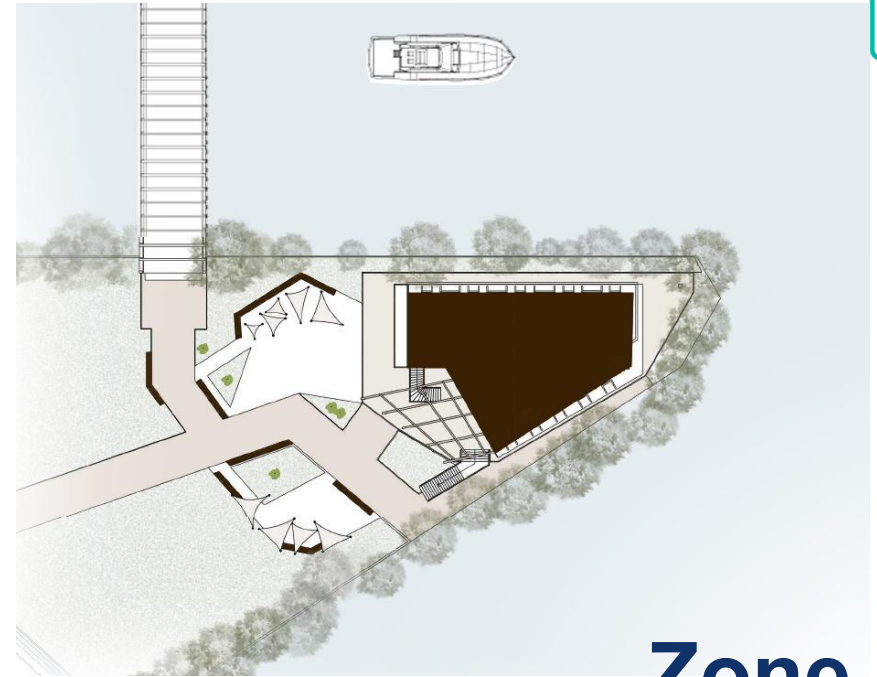
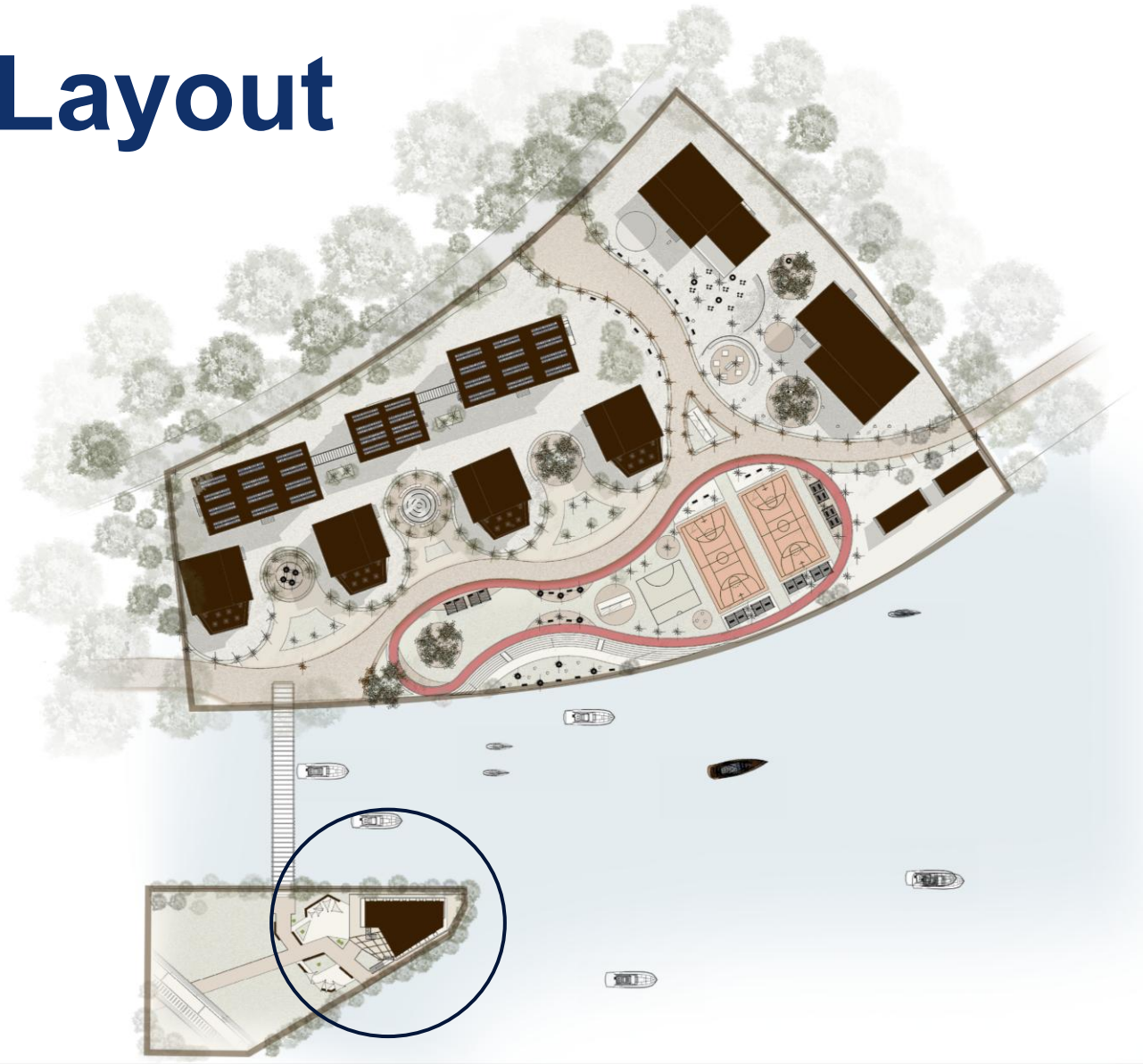
# Renovated Yacht Club



# Yacht Club



# Layout



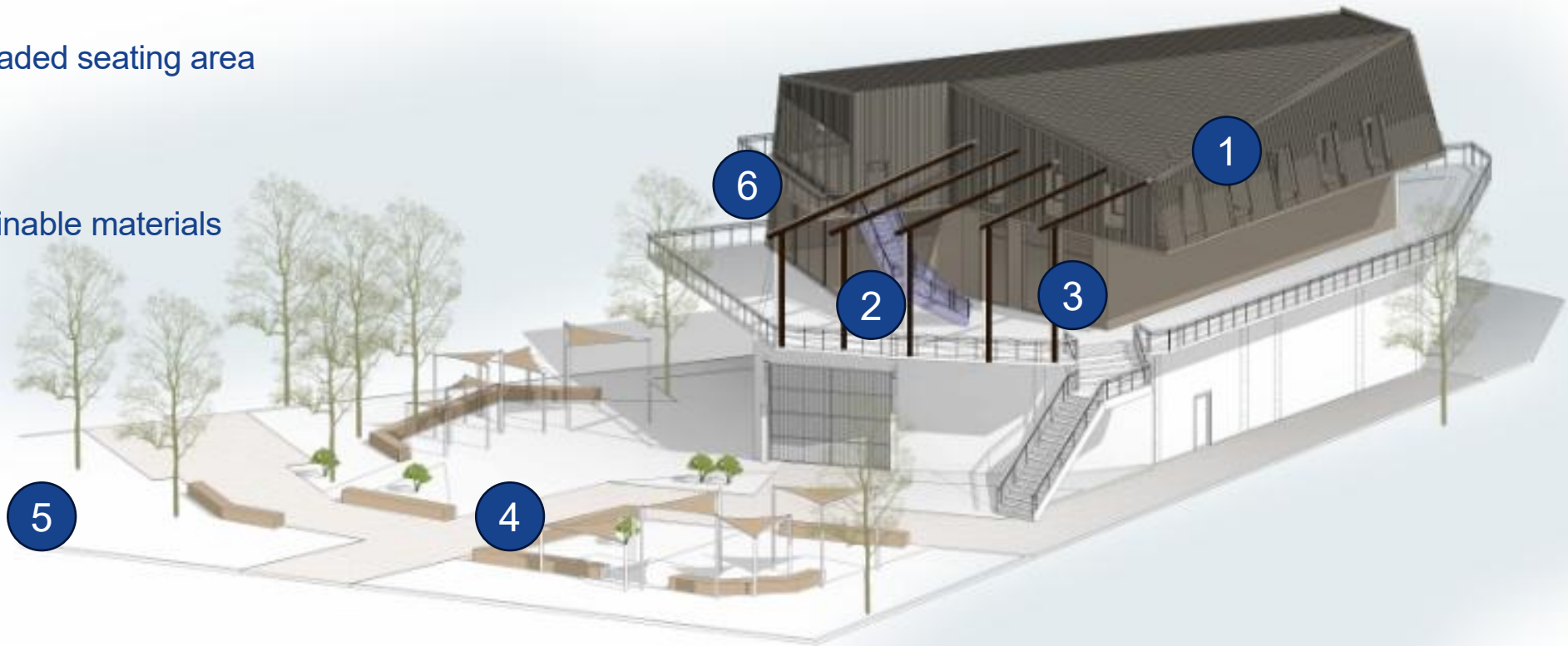
**Zone B**

**Zone A and Zone B**

*Image's source: developed by the authors.*

# Changes

- 1 Changing roof color
- 2 Add shed
- 3 Add stairs
- 4 Design shaded seating area
- 5 Planting
- 6 Terrace
- 7 Use sustainable materials



*Image's source: developed by the authors.*

# Yacht Club

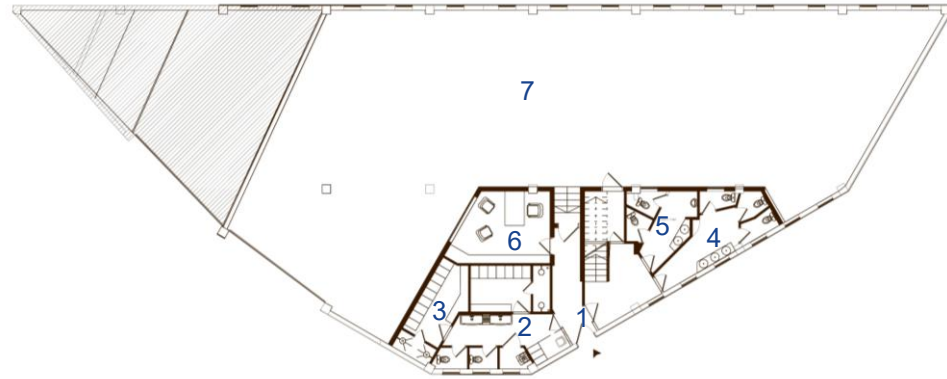


## Building Key (Ground)

- 1 Entrance Lobby
- 2 Changing rooms
- 3 Dressing
- 4 Ladies room
- 5 Men room
- 6 Seating area
- 7 Boats garage and maintenance

## Building Key (First)

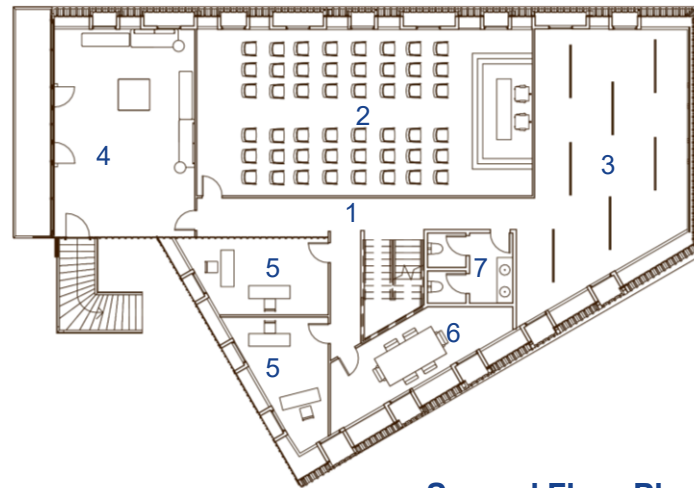
- 1 Storage
- 2 Mini cafe
- 3 Gathering space
- 4 MPU
- 5 Co-working Space
- 6 Terraces



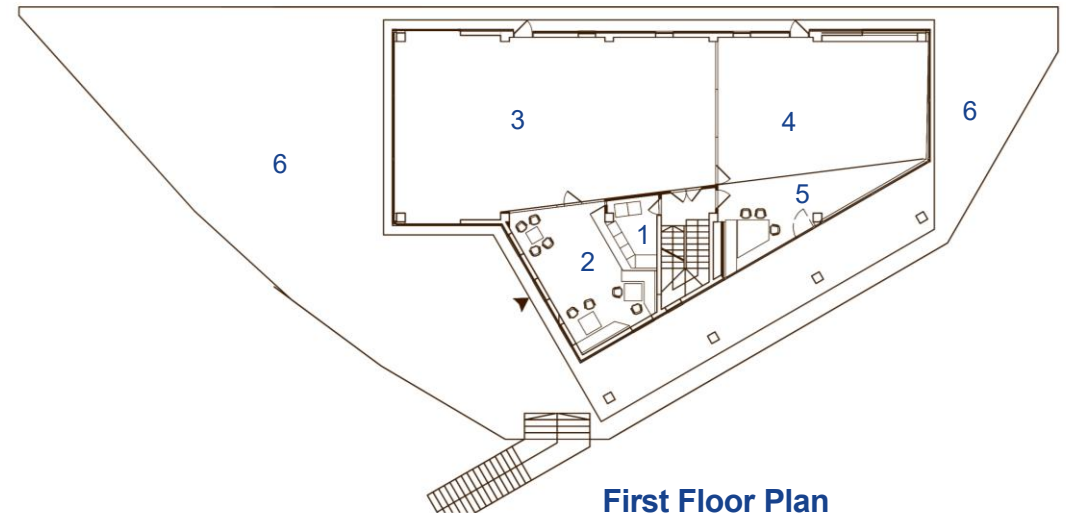
Ground Floor Plan

## Building Key (Second)

- 1 Corridor
- 2 Celebration hall
- 3 Open Gallery
- 4 Seating area
- 5 Offices
- 6 Meeting room
- 7 WC



Second Floor Plan



First Floor Plan

Image's source: developed by the authors.

# Yacht Club

## Shading system

Shading system is inspired by the tension and geometry of traditional boat sails, seamlessly blending structural efficiency with aesthetic elegance."



*Image's source: developed by the authors.*



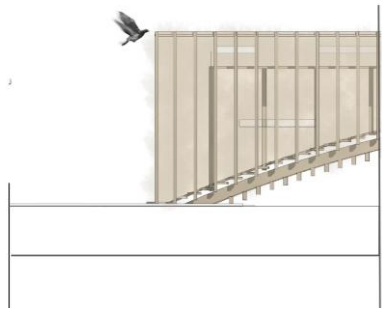
# Linking Zone A with Zone B

# View Of The Developed Bridge That Links Zone A To Zone B

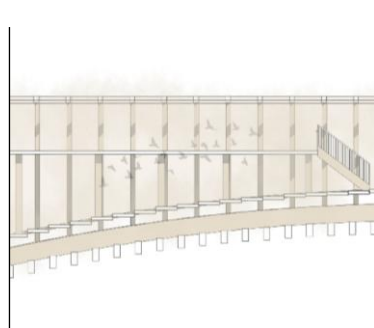


# Bridge

Nesting material for birds



Visual Buffer



Birds' watching platform



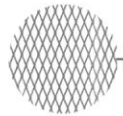
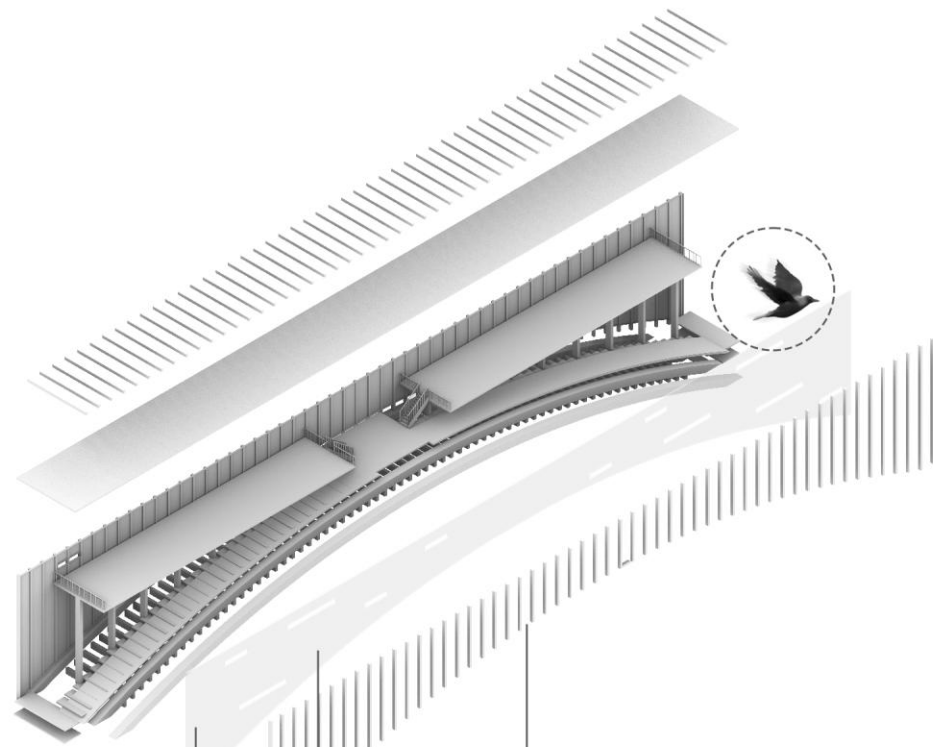
Link



ARCHITECTURE  
STUDENT  
CONTEST

Images' source: developed by the authors

# Bridge's structure



Metal Mesh



Wood waste



Wood



Bridge's section



Side elevation

The bridge is constructed from a robust timber structure, designed as a bird-watching platform. It is clad with layered wooden elements that allow birds to interact and acts as a visual buffer.

# Sustainable Planning for Nature

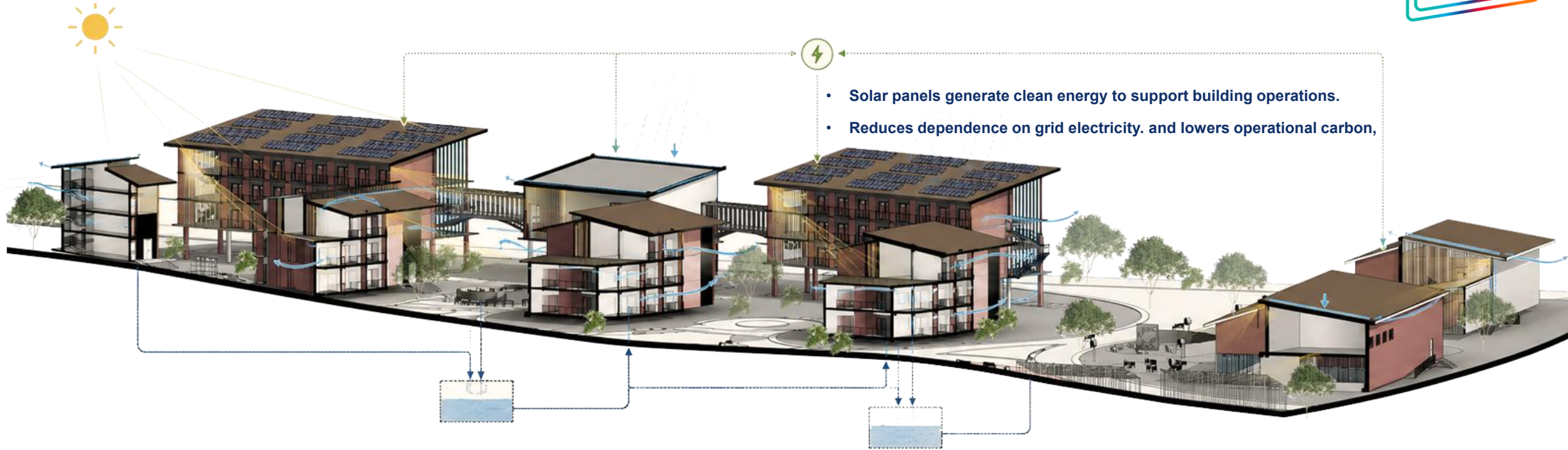
(1-4)



 Natural Daylight

 Ventilation

 Rainwater



Environmental Section Diagram

## ★ The SDGs Achieved



Images' source: developed by the authors

- Daylight penetrates through windows, openings, and circulation spaces.
- Rainwater collected from non-solar roofs, filtered, and stored in underground tanks.
- Cross ventilation through openings and circulation spaces.
- Elevated structures promote airflow underneath

# Sustainable Planning for Nature

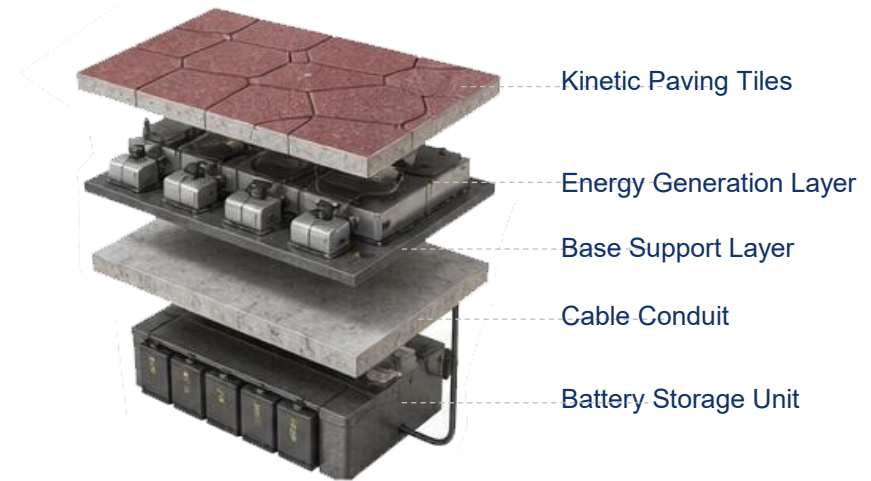
(2-4)



## Kinetic Energy Paving

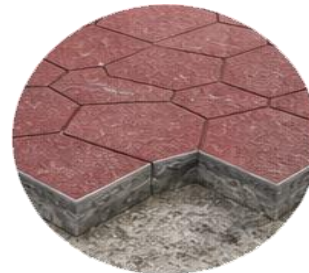


## Kinetic Paving System Layers

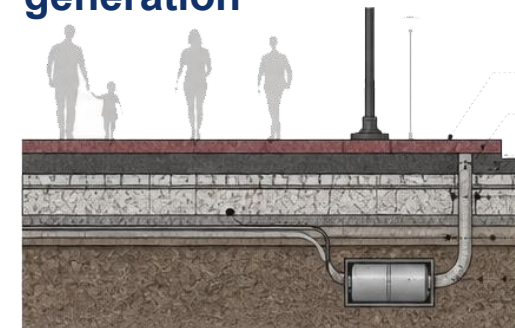


- Footsteps create pressure on the kinetic tiles
- Internal mechanism converts motion into electricity
- Electricity is stored in oatteries
- Used for lighting, benches, and public facilities

## Hard Landscape flooring Material detail



## Section of the clean energy generation



*Images' source: developed by the authors*

# Sustainable Planning for Nature

(3-4)



## Permeable Paving System



## Rainwater Collection Section



### 01 Permeable Concrete Paving

- Water infiltrates through the surface reducing runoff and improving groundwater recharge. Rainwater collected from non-solar roofs, filtered, and stored in underground tanks.

### 02 Green Landscape

- Soil and planting areas absorb and filter rainwater naturally

### 03 Terraced Steps

- Integrated seating and circulation with permeable edges.

### 04 Underground Storage

- Collected water is stored and reused for irrigation and landscape needs

## Exploded Axonometric



- Permeable Concrete Paving
- Bedding Layer (2-5 mm)
- Open-graded Base (20-40 mm)
- Geotextile Membrane
- Perforated Drainage Pipe
- Gravel Reservoir (40-80 mm)
- Compacted Subgrade

Images' source: developed by the authors

# Sustainable Planning for Nature

(3-4)



## Rainwater Harvesting System

### Sloped Roof

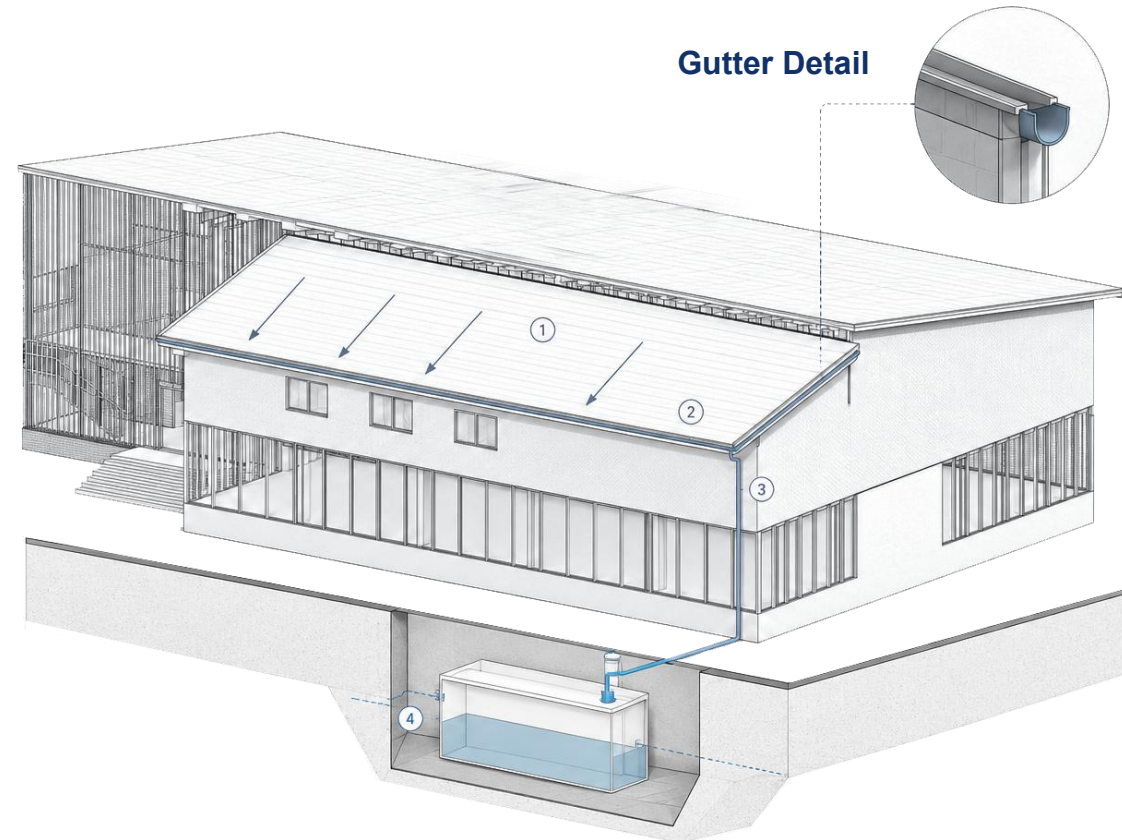
- Roof slopes direct rainwater towards the gutters

### Gutter System

- Gutters collect rainwater along the roof edge

### Downpipes

- Downpipes convey water from gutters to the storage tank



Underground storage Tank

Rainwater is stored underground and used for non-potable purposes

*Images' source: developed by the authors*

# Life Cycle Energy Calculations

(1-5)

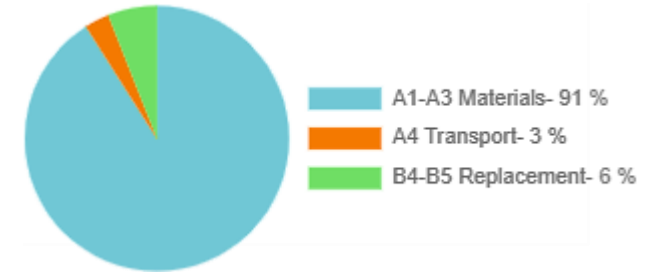
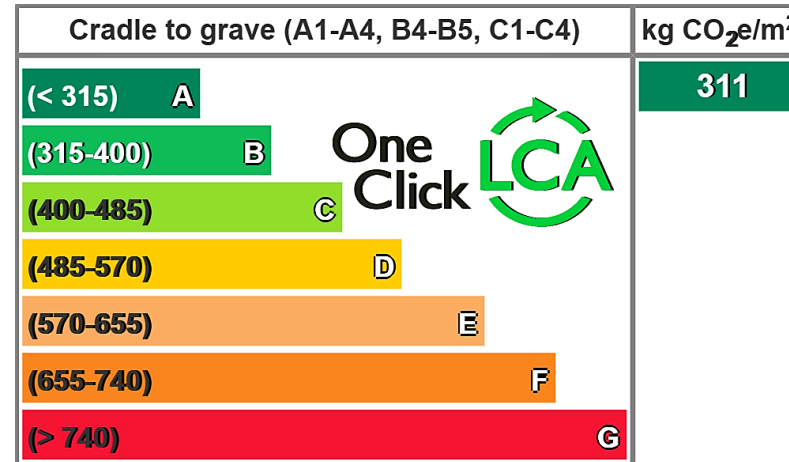
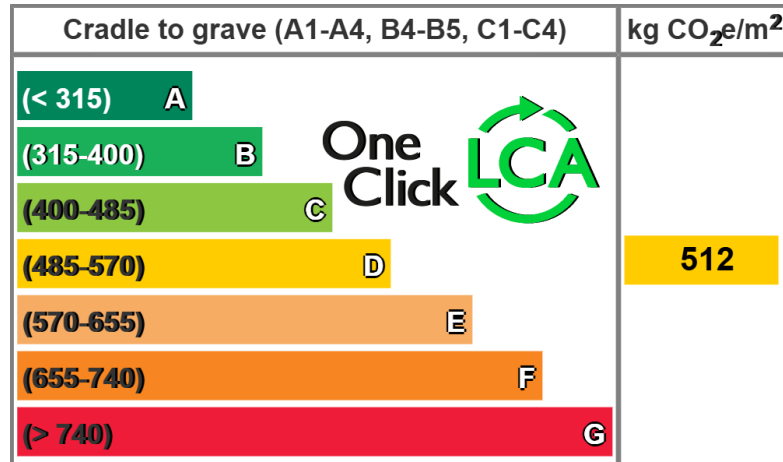


Before

After

## Conventional Concrete Version

## Sustainable intervention using earth materials



### Embodied Carbon Benchmark

- Heavy concrete structure
- Conventional glazing systems
- Standard HVAC systems
- No renewable energy integration
- High embodied carbon emissions

### Embodied Carbon Benchmark

- Timber & CLT systems
- Saint-Gobain insulation
- High-performance glazing
- Solar & wind energy
- Rainwater harvesting



512 → 311 kg CO<sub>2</sub>e/m<sup>2</sup>

≈ 40% Carbon Reduction

Images' source: developed by the authors based on Click

# Life Cycle Energy Calculations

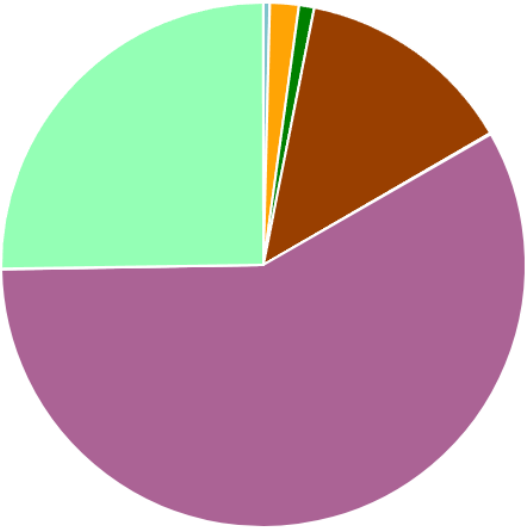
(2-5)



## Embodied Carbon Distribution

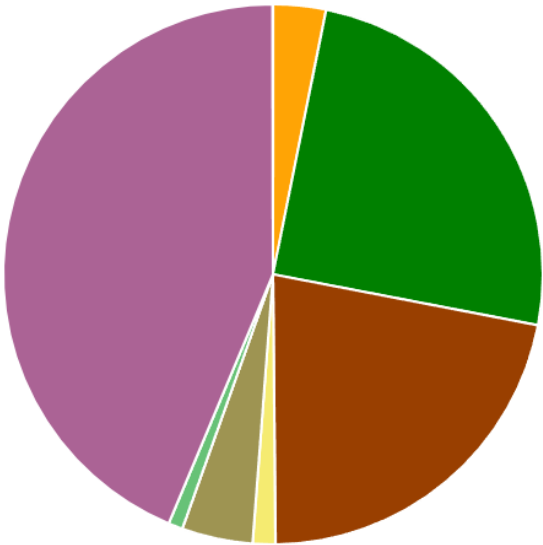
Global Warming Potential total kg CO2e - Life-cycle stages

- A4 Transport - 0.4%
- A5 Construction - 1.8%
- B4-B5 Replacement - 0.9%
- B6 Energy - 13.5%
- B7 Water - 0.0%
- C2 Waste transport - 0.1%
- C3 Waste processing - 0.0%
- C3-balancing Biogenic waste processing - 58.0%
- C4 Waste disposal - 0.0%
- C4-balancing Biogenic waste disposal - 25.2%



Global Warming Potential total kg CO2e - Classifications

- 1.1 Foundations (substructure) - 0.0%
- 1.2 Load bearing structural frame - 3.2%
- 1.2.3 External walls - 24.9%
- 1.3.1 Ground floor slab - 21.8%
- 1.3.2 Internal walls, partitions and doors - 1.4%
- 1.4.2 Façade openings - 4.3%
- 2. Core (fittings, furnishings and services) - 0.8%
- Electricity use - 43.7%
- Total water consumption - 0.0%



# Life Cycle Energy Calculations

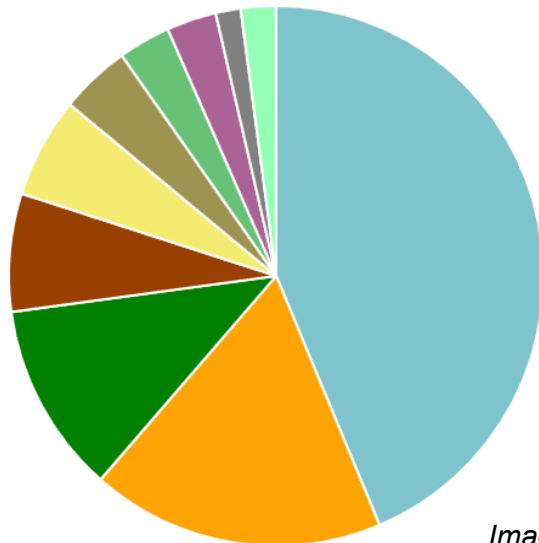
(3-5)



## Global Warming Potential total kg CO2e - Resource types

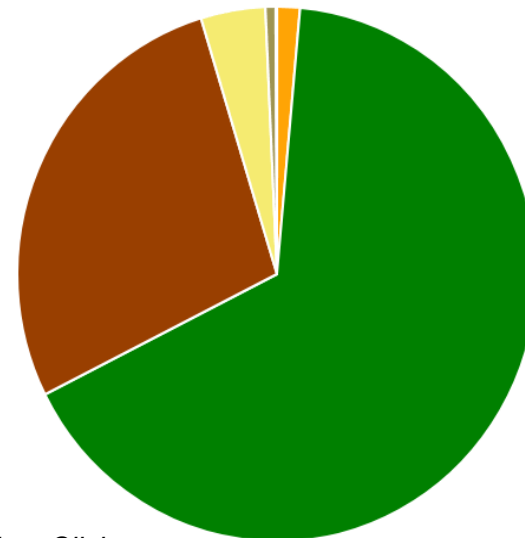
This is a drilldown chart. Click on the chart to view details

- Electricity - 43.7%
- Treated or coated timber - 17.7%
- CLT, glulam and LVL - 11.5%
- Leveling screeds (for floors) - 7.1%
- Insulated wood elements - 6.0%
- Aluminium frame windows - 4.3%
- Structural steel and steel profiles - 3.2%
- Specialty gypsum board - 3.0%
- Bitumen and other roofing - 1.5%
- Other resource types - 2.1%



## Mass kg - Classifications

- 1.1 Foundations (substructure) - 0.0%
- 1.2 Load bearing structural frame - 1.4%
- 1.2.3 External walls - 66.1%
- 1.3.1 Ground floor slab - 27.7%
- 1.3.2 Internal walls, partitions and doors - 4.0%
- 1.4.2 Façade openings - 0.7%
- 2. Core (fittings, furnishings and services) - 0.1%



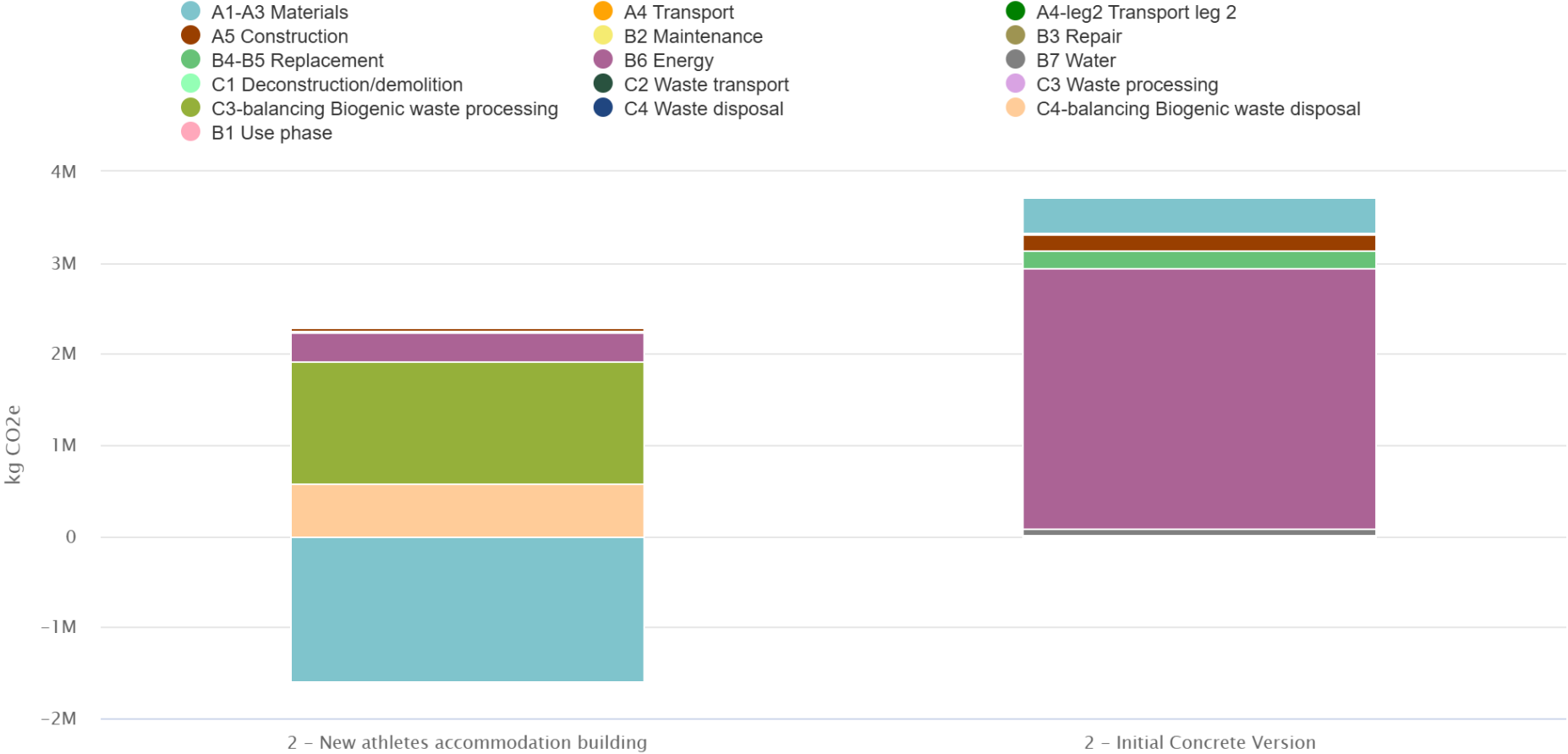
Images' source: developed by the authors based on Click

# Life Cycle Energy Calculations

(4-5)



## Carbon Mitigation Comparison



Images' source: developed by the authors based on Click

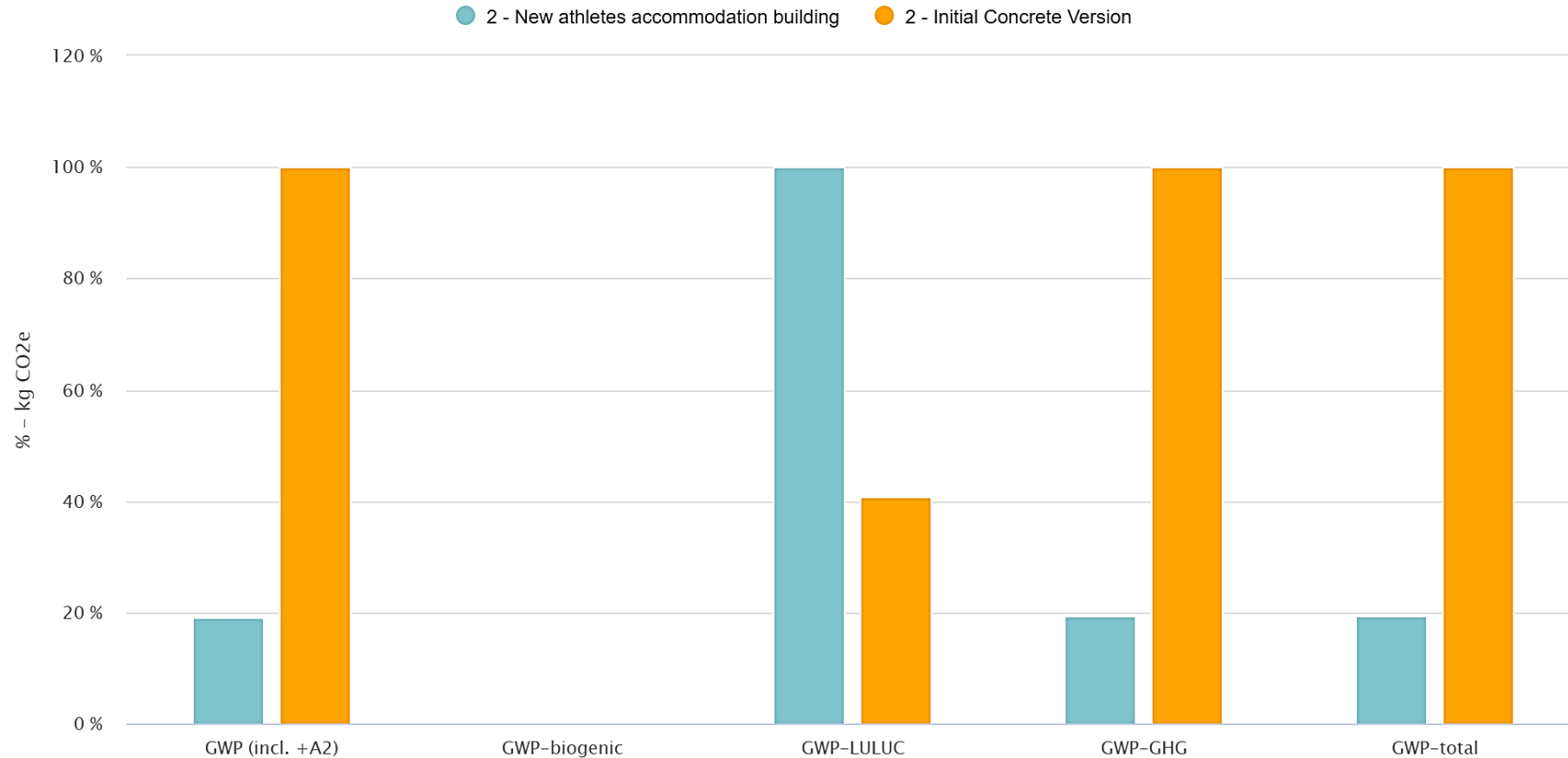


# Life Cycle Energy Calculations

(5-5)



## Carbon Mitigation Comparison



Images' source: developed by the authors based on Click

# Thank you

# Merci

# БЛАГОДАРЯ