



ARCHITECTURE STUDENT CONTEST
21st INTERNATIONAL EDITION, BELGRADE 2026

Team 01 - Serbia 

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SON OF THE SUN





ABSTRACT

*"The Son of the Sun" * project is a response to Belgrade's long-held dream bringing the city to the river. Throughout history, this vision was never fully realized, despite the city's great potential offered by its two rivers, the Sava and the Danube, which have remained underutilized as spaces for public life.*

The aim of this project is to demonstrate how a spatial intervention can fulfill the desire of a large number of residents for a direct contact with the river. The project brings together the diverse needs of the city's inhabitants related to spending time and engaging in activities near the water, which until now have lacked an adequate framework.

The proposed sports and recreational urban center is a comprehensive space intended for all generations, and especially for the youngest, for whom closeness to the river and early engagement in sport can provide positive experiences and a healthy foundation for a "sunny future".

* "The Son of the Sun" the name of the song by the famous musician from Belgrade, Zoran Kostić Čane

CONTENTS

+ Site Analysis
Urban analysis of the competition sites,
with attention to the characteristics of
the surrounding context and the
potentials of each location.

01

02

+ Project Concept
Explanation of the concept underlying
the projects at both locations, together
with the narrative behind them.



+ New Building
Presentation of the architectural solution
illustrated through technical
documentation, including site plan, floor
plans, sections, and elevations.

03

+ Energy Efficiency
Presentation of sustainable solutions illustrated through
specific project details and the integration of Saint-Gobain
systems.

04

+ Renovated Building
Presentation of the architectural solution illustrated
through technical documentation, including site plan,
floor plans, sections, and elevations.

05

01

LOCATION ANALYSIS

Belgrade



LOCATION CONTEXT

Context and Potential for Urban Regeneration

The location represents a critical point on the left bank of the Sava River, situated at the intersection of Belgrade's key urban and natural corridors. Its strategic significance is defined by the convergence of the future Linear Park, which aims to continuously connect the city's riverfronts, and the landscape axis of the Japanese Cherry Blossom Park. This position offers a unique opportunity for the formation of a powerful architectural landmark and an urban marker that will inspire the transformation of the wider area.

+ Current State

Despite its potential, the current state of the location is blighted. The area is dominated by a concrete batching plant, which serves as a visual and environmental symbol of industrial exploitation and the degradation of the riverfront. This space constitutes a physical barrier, a "wound" in the urban fabric that prevents residents from achieving adequate access to and engagement with the river. The surroundings are further burdened by the industrial zone of the shipyard, which requires revitalization in order to be integrated into the vital fabric of the city.

+ Future Context

The location is situated within a zone of dynamic urban change. Directly opposite, on the cape, lies the existing building of the Academic Sailing Club (relocated from Ada Ciganlija), which already establishes the sporting character and value of this section of the coast. Across the river, the Fairground site is being prepared for demolition to allow for the expansion of the Belgrade Waterfront, whose modern grid will reach the subject location itself. This impending context of modern architecture establishes the imperative for aligning new structures with the river and the legacy industrial heritage, rather than disrupting them.

The proximity of the strict city center and the main Sava quay, which extends all the way to Zemun, further underscores the attractiveness and accessibility of this stretch. The revitalization of this location has the potential to become a symbol of ecological renewal, transforming a degraded industrial zone into an inclusive, sustainable urban hub that celebrates the river and changes the daily habits of citizens.

Legend

	<i>Competition location</i>		<i>Green zone</i>
	<i>Industrial zone</i>		<i>Built up area</i>
	<i>Belgrade Waterfront Project</i>		<i>Line park</i>



01

LOCATION ANALYSIS

New Belgrade



NEW BELGRADE

New Belgrade is the materialization of a modern utopia, raised from marshland through the collective effort of Youth Work Actions. It represents a rupture with the past and the birth of a new social order through a radical landscape transformation.

From the Fair to an Architectural Laboratory: Modernization began with the Belgrade Fair, whose daring concrete structures set the standards for the New Belgrade school. Development was a strictly professional process driven by architectural competitions, turning the city into a laboratory where leading architects defined a coherent urban system.

Realized Blocks and Riverfront Discontinuity: While inland entities like Block 21 were completed as monuments to functionalism, the sites along the riverfront were never fully realized. Initially intended as the primary interface between the city and the water, this space remained a "void." Our project intervenes at this junction, aiming to finally reconcile the strict logic of the block with the freedom of the riverfront.



01

LOCATION ANALYSIS

"learn from the past"*



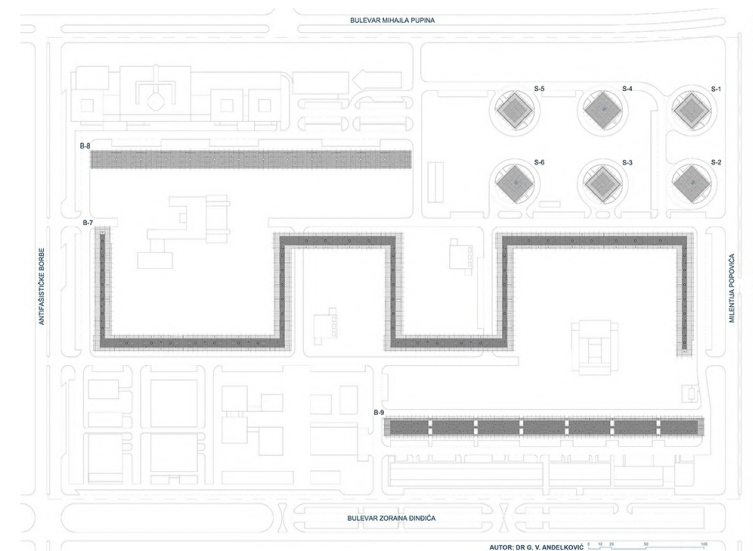
MEANDER

New Belgrade icon building

Built between 1960 and 1966 in Block 21, the “Meander” represents one of the key realizations of **New Belgrade modernism**. This nearly **one-kilometer-long** residential complex is shaped as a continuous, sinuous structure that passes through four city streets, connecting different parts of the urban fabric.

Its form – resembling a double “S” – enables the organization of a large number of residents into a functional and legible whole. As a New Belgrade **block in miniature** the building integrates housing, movement, and everyday life, while simultaneously creating protected inner spaces and a series of **urban pockets** – places for interaction, play, and informal community life.

Within the context of New Belgrade, the “Meander” follows modernist principles inspired by the ideas of Le Corbusier – rationality, functionality, and collective living. Its articulated form allows for light, views, and spatial diversity, breaking the monotony of a linear structure. For our project, the “Meander” becomes a key reference, demonstrating how a single building can assume the role of an entire block. Its ability to integrate diverse functions, organize movement, and foster a sense of community directly informs our concept – a single structure that brings together education, sport, and public life.



01

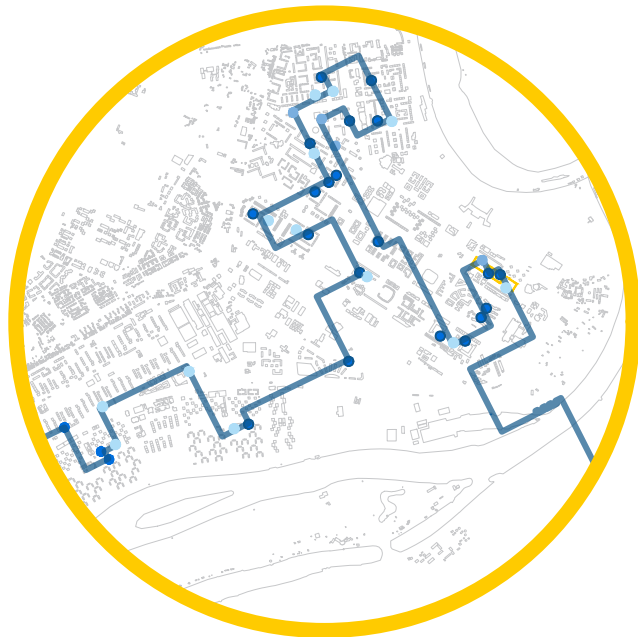
LOCATION ANALYSIS

New Project

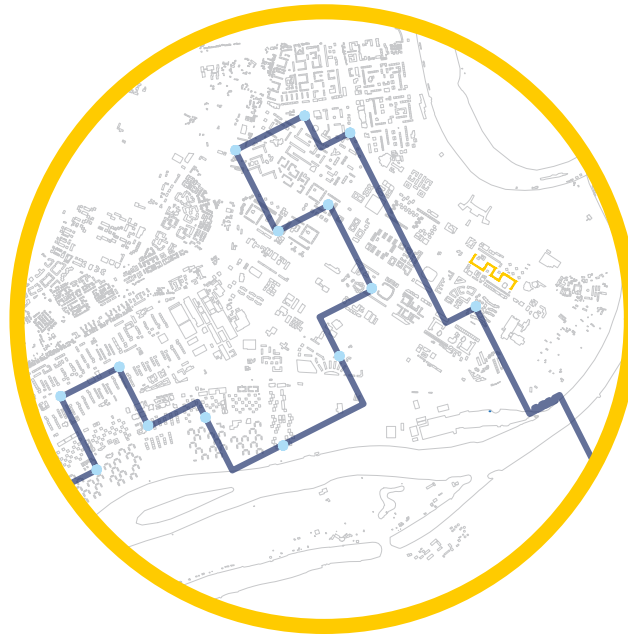
MAPPING EDUCATIONAL INSTITUTIONS

The comprehensive mapping of educational institutions from preschools to higher education revealed a critical spatial failure: a complete absence of planned contact between children's activities and the river. This disconnect is deeply problematic for a city defined by the confluence of the **Danube and Sava**. This early separation directly results in decreased interest in water and aquatic sports. The architectural intervention is therefore an imperative to re-establish this severed connection, transforming the river from a visual backdrop into an active polygon for education and development.

■ High school ■ Kindergarden ■ Elementary school



■ Courts / Playgrounds



MAPPING CHILDREN'S PLAYGROUNDS

An analysis of children's sports facilities confirmed an identical deficit: a lack of direct waterfront contact. Existing infrastructure predominantly follows the traditional introverted New Belgrade block model, where children are hermetically isolated within inner courtyards. Our intervention strives for a radical shift bringing children to the riverfront to grow up in direct contact with the sun and water.

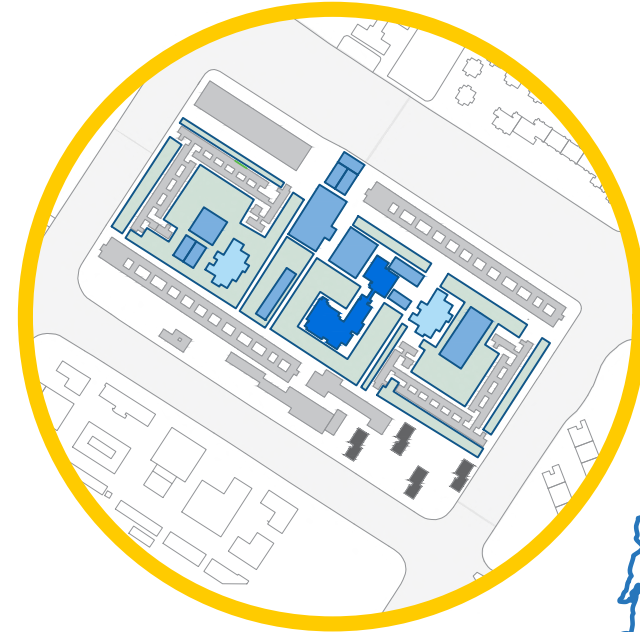
The conceptual decision to position children's programs in close physical and visual proximity to the professional sports center carries a dual message. It provides children with accessible role models, allowing them to feel like "little champions-observers," while creating an inclusive space where athletes can celebrate success collectively with the community, erasing traditional barriers.

TYPICAL NEW BELGRADE BLOCK

The New Belgrade block is an efficient, compact entity unifying education, play, and recreation, yet this high organization creates an auto-referential, closed system directed exclusively inward. The key shortcoming is its phenomenological and physical isolation from the river, despite its immediate geographical proximity.

In this project, the block serves as a functional model, but a missing sequence is added: the connection to nature. The proposed youth center hybridizes essential contents into a single entity and projects them directly onto the river. This transforms the "protected courtyard" principle into an open, dynamic system oriented toward the water, making the river a new, shared courtyard.

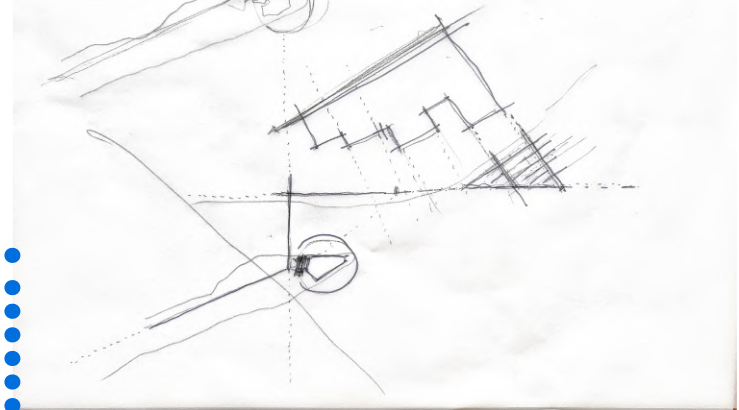
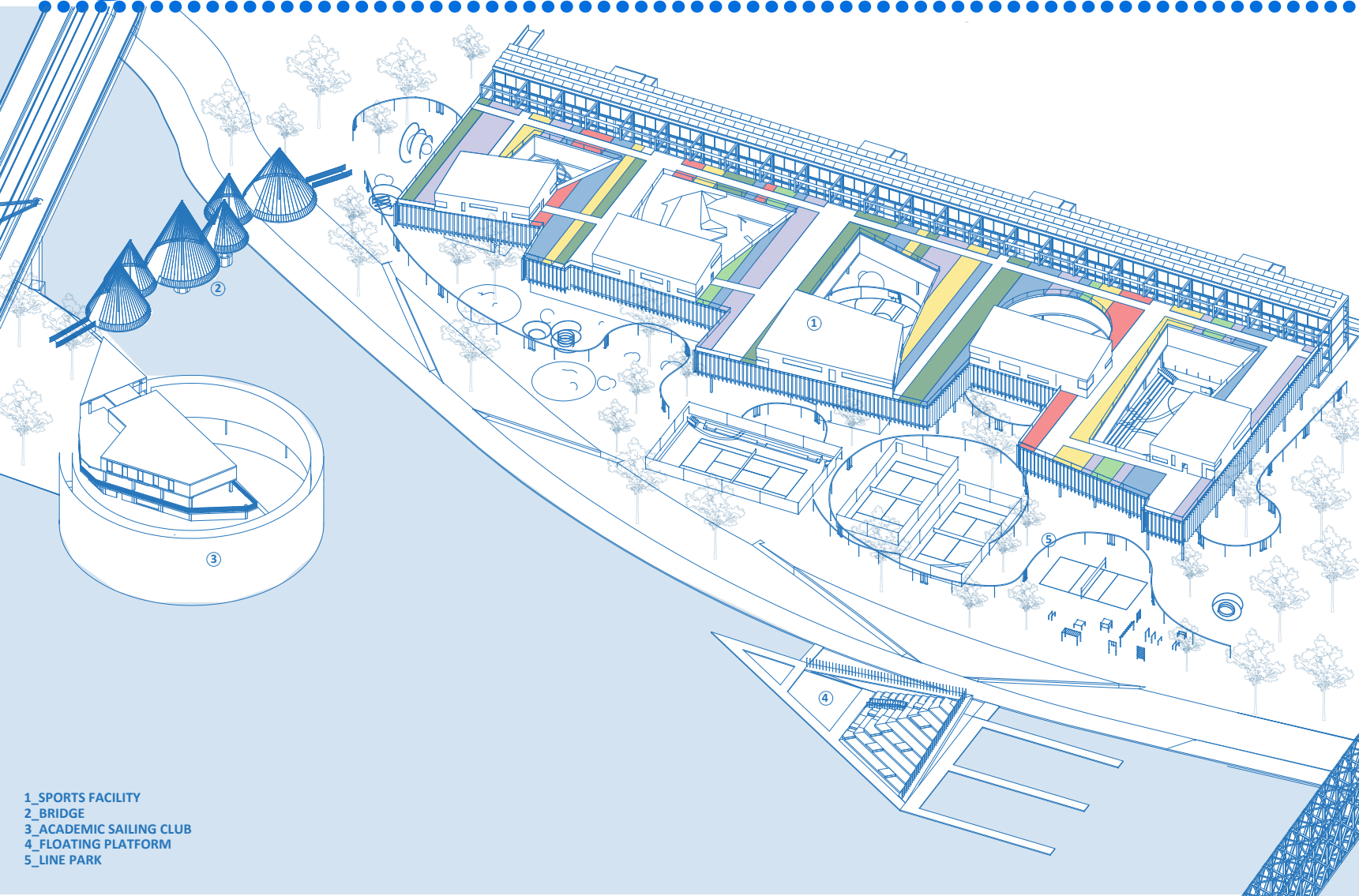
■ School ■ Courts / Playgrounds ■ Building
■ Kindergarden ■ Open areas ■ Soliter



02

NEW PROPOSAL

Project concept



MASTERPLAN

This masterplan presents a comprehensive vision for a new sports and recreational hub on the banks of the Sava River. The concept is rooted in the idea of a unified spatial sequence that bridges the reconstruction of existing structures with the development of new architectural forms, creating a dynamic environment for athletes, children, and the public.

The masterplan encompasses two distinct locations treated as an indivisible totality.

Reconstruction Site: The existing facility of the Academic Sailing Club Belgrade's oldest sailing institution is reconstructed to meet contemporary athletic standards. Beyond enhanced sports infrastructure, the second floor houses the Museum of the Academic Sailing Club, providing this historic institution with the representative space it deserves on such an attractive site. Access to the museum is orchestrated through a sculptural ramp, alongside a lift and stairs, offering visitors diverse spatial experiences and vantage points.

New Construction Site: This site is designated for a modern municipal center catering to the city's youth and professional athletes. The program integrates high-standard accommodation, diverse sports courts, educational facilities, and interactive play zones, offering children an unprecedented, immersive experience of the riverfront.

+ Urban Regeneration and Connectivity

The masterplan embeds itself within a broader urbanistic context, leveraging the potential of the Linear Park, which serves as a vital artery connecting Old and New Belgrade at this exact junction. By extending the Japanese Cherry Blossom Park and the existing embankment directly into the heart of the site, the project reinforces its ecological and landscape-driven character.

+ A Vision for the Future

This masterplan represents a future where Belgrade finally reconciles with its rivers, creating a space that inspires, educates, and connects. It stands as a symbol of ecological renewal and a testament to our commitment to building a more resilient, inclusive, and vibrant city for future generations.

- 1_ SPORTS FACILITY
- 2_ BRIDGE
- 3_ ACADEMIC SAILING CLUB
- 4_ FLOATING PLATFORM
- 5_ LINE PARK

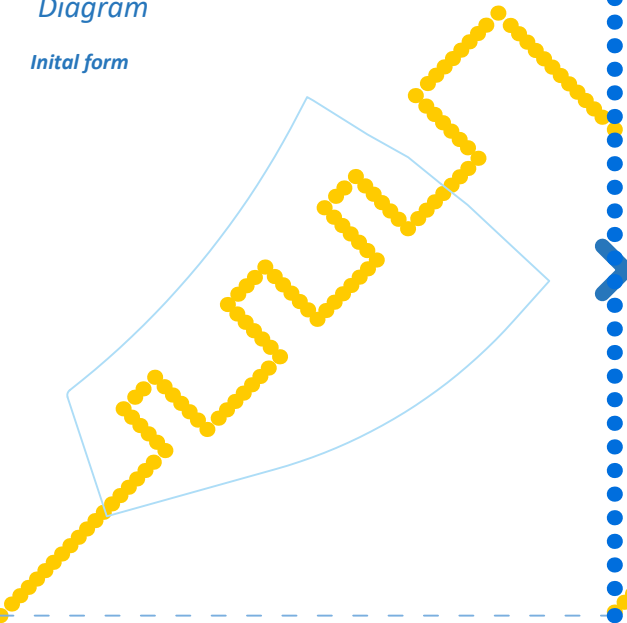
03

NEW BUILDING

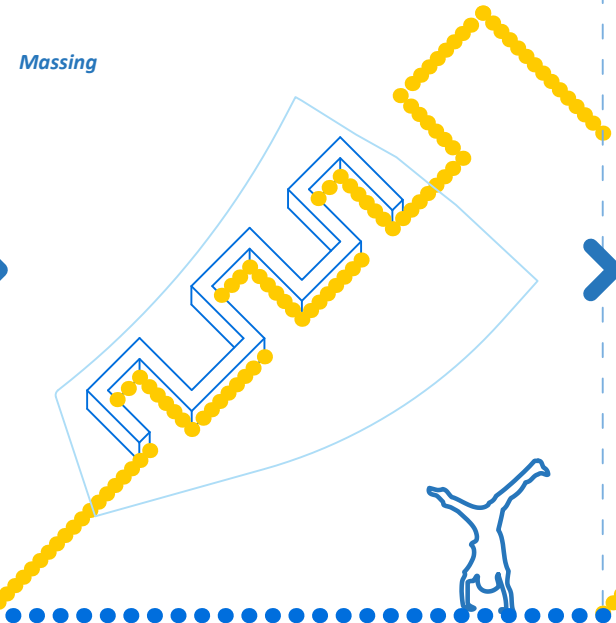


CONCEPT EVOLUTION - NEW BUILDING
Diagram

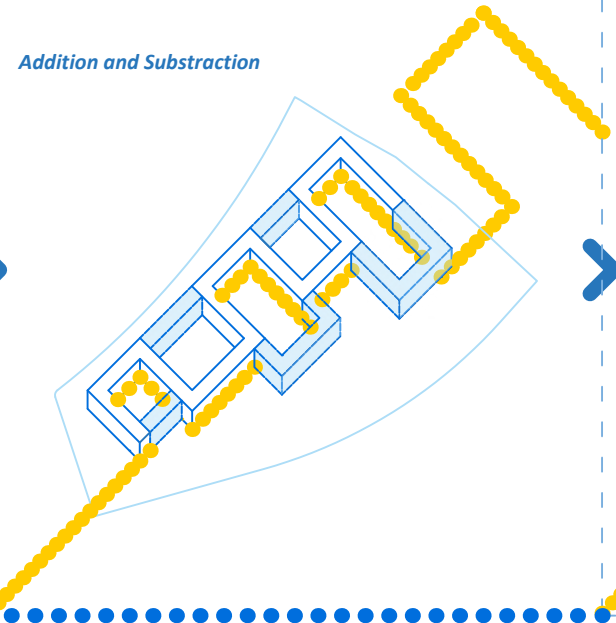
Initial form



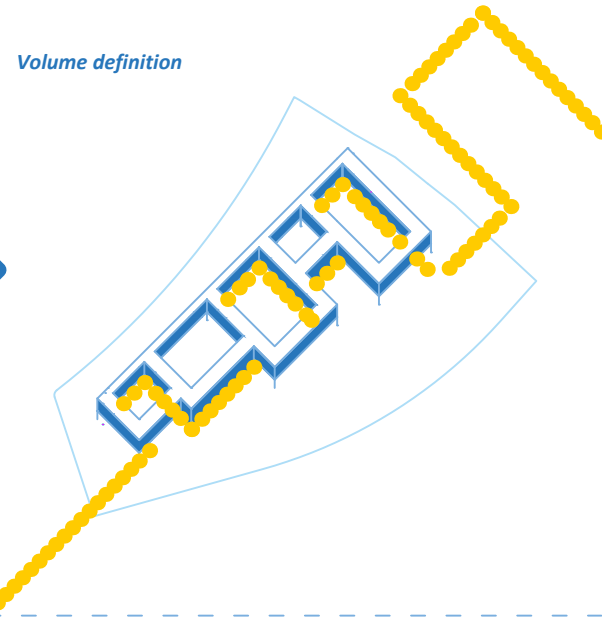
Massing



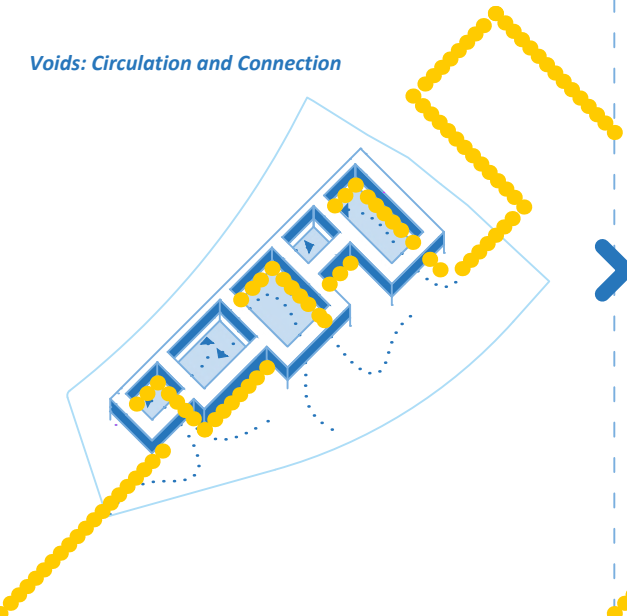
Addition and Substraction



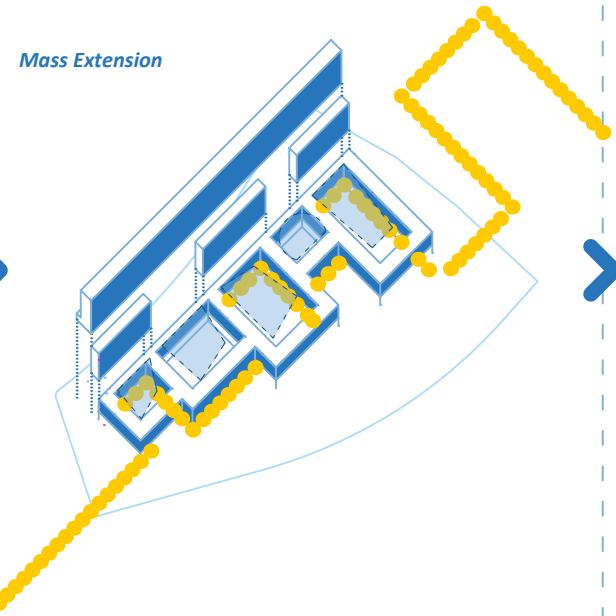
Volume definition



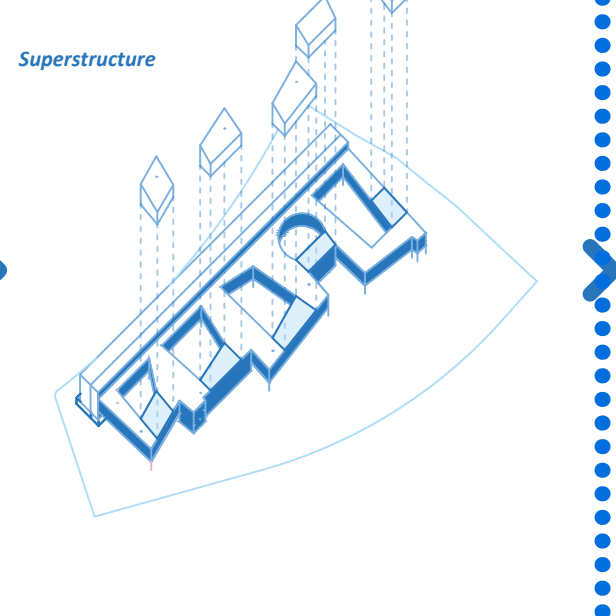
Voids: Circulation and Connection



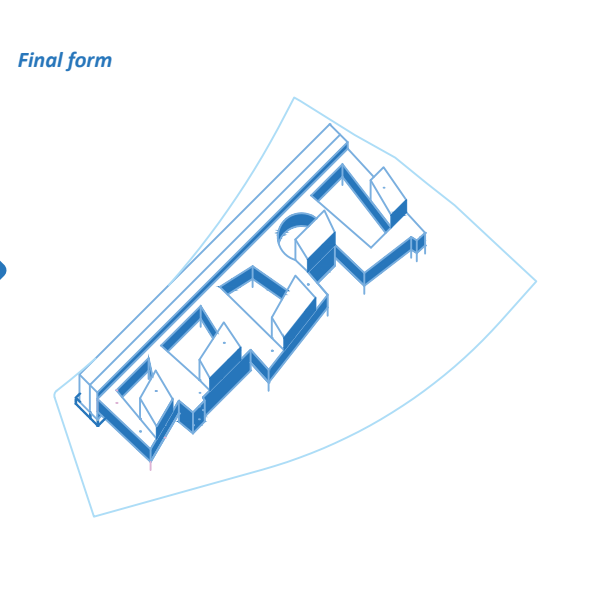
Mass Extension



Superstructure



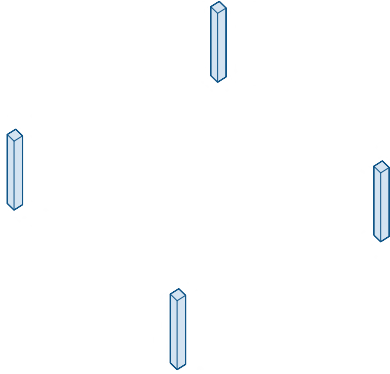
Final form



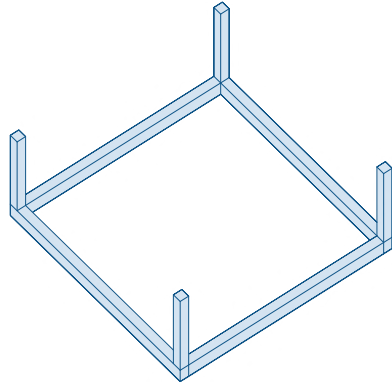
DEVELOPMENT OF PREFABRICATED HOUSING UNIT

Diagram

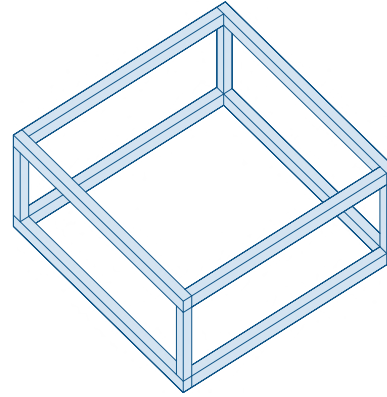
Columns



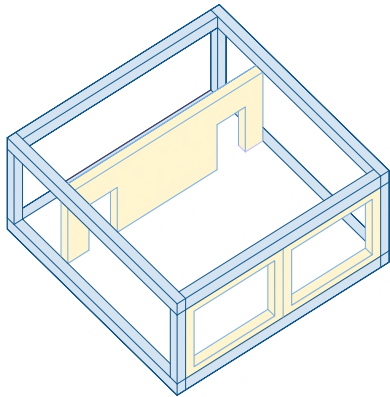
Beams



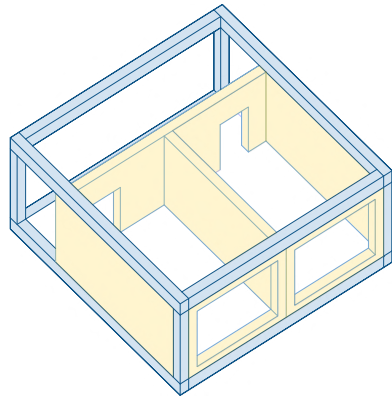
Frame structure



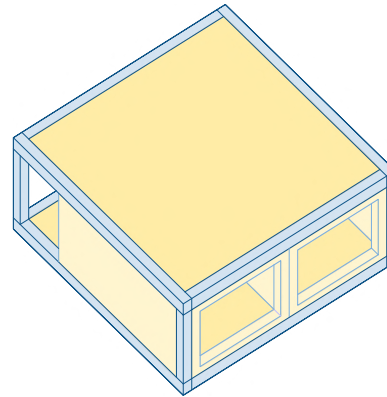
Transverse wall panels



Longitudinal wall panels



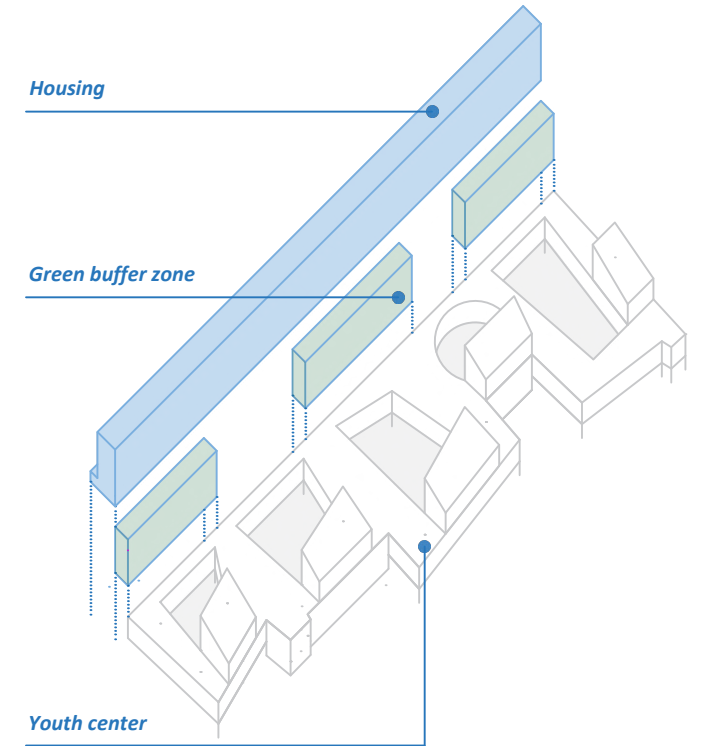
Floor panel

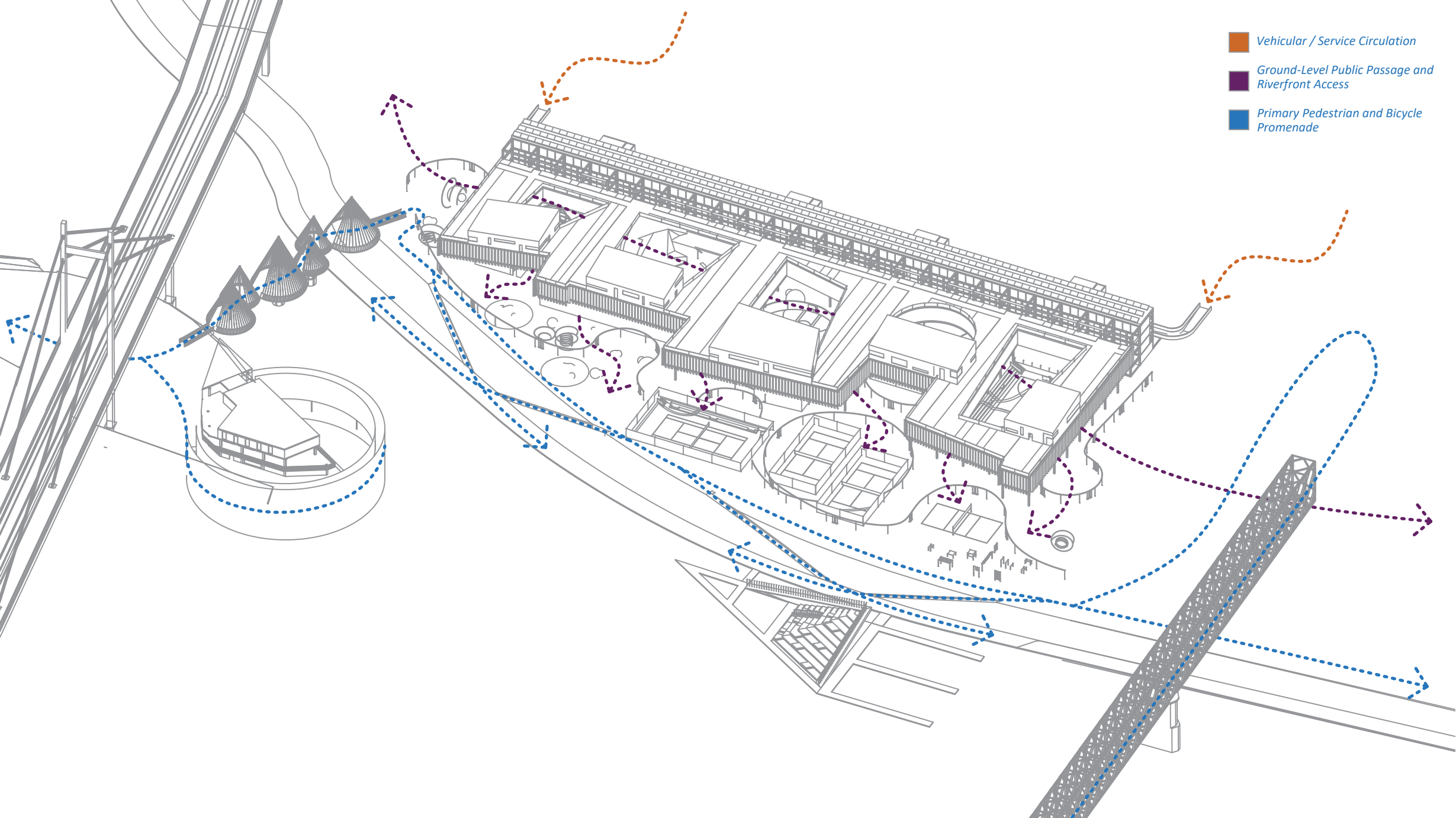


CONSTRUCTIVE SYSTEM

The housing unit is conceived as a prefabricated modular system. A primary structural frame defines the spatial and structural logic of the unit, while prefabricated wall, floor and roof panels are attached to the structure to complete the envelope.

This system allows a fast and efficient assembly process, while maintaining flexibility in configuration. Additional prefabricated elements, such as terraces, can be attached to the primary frame, enabling different spatial variations and future extensions.

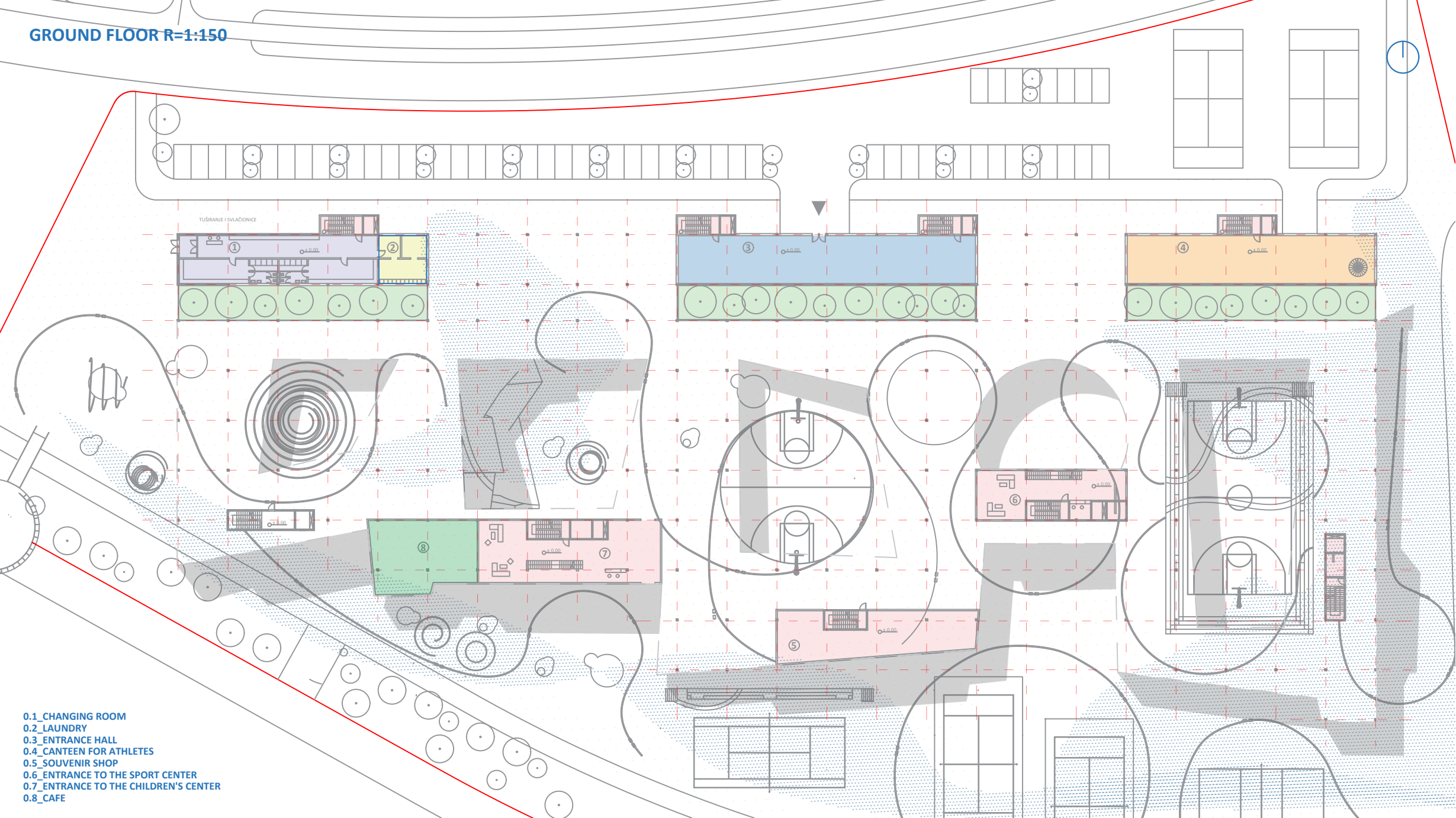




Vehicular / Service Circulation

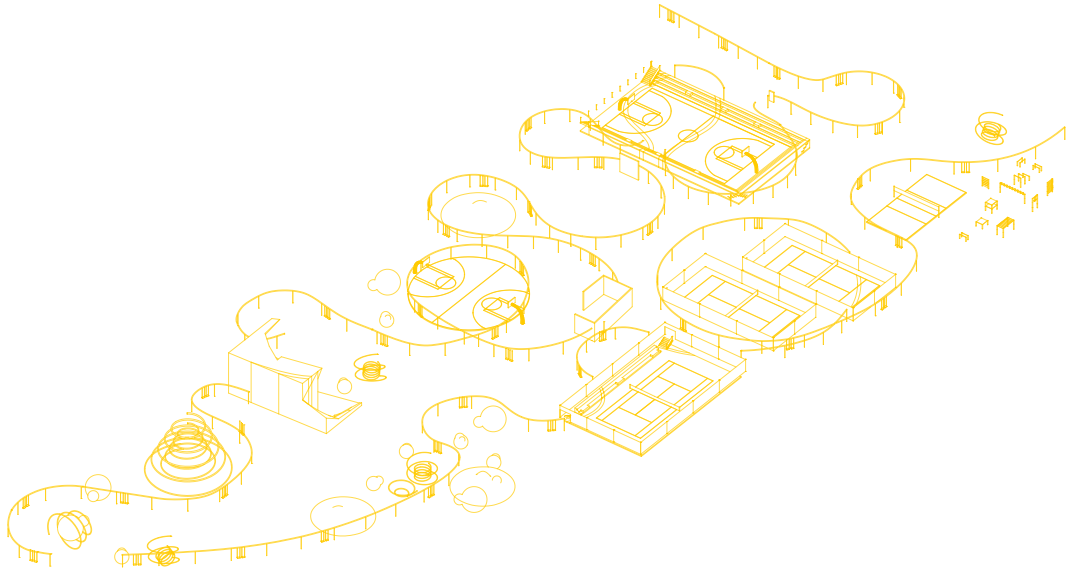
Ground-Level Public Passage and Riverfront Access

Primary Pedestrian and Bicycle Promenade



- 0.1_CHANGING ROOM
- 0.2_LAUNDRY
- 0.3_ENTRANCE HALL
- 0.4_CANTEEN FOR ATHLETES
- 0.5_SOUVENIR SHOP
- 0.6_ENTRANCE TO THE SPORT CENTER
- 0.7_ENTRANCE TO THE CHILDREN'S CENTER
- 0.8_CAFE

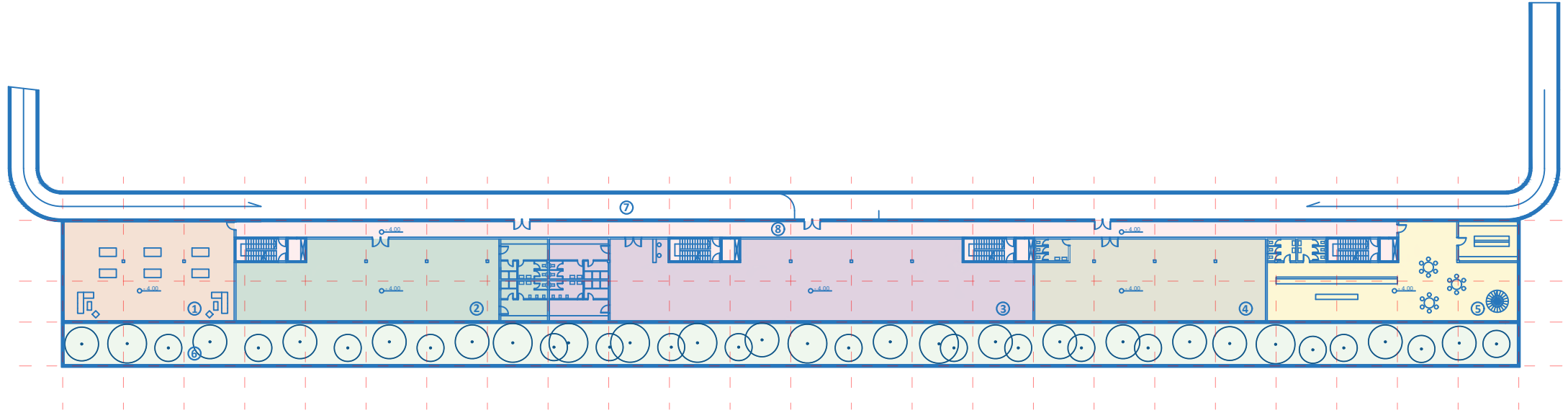
GROUND FLOOR SPATIAL INTERVENTION



The ground floor layout is designed to accommodate diverse groups of users, activating a variety of recreational zones throughout from basketball and padel courts to swings and smaller open-air courts creating a dynamic and engaging public space.

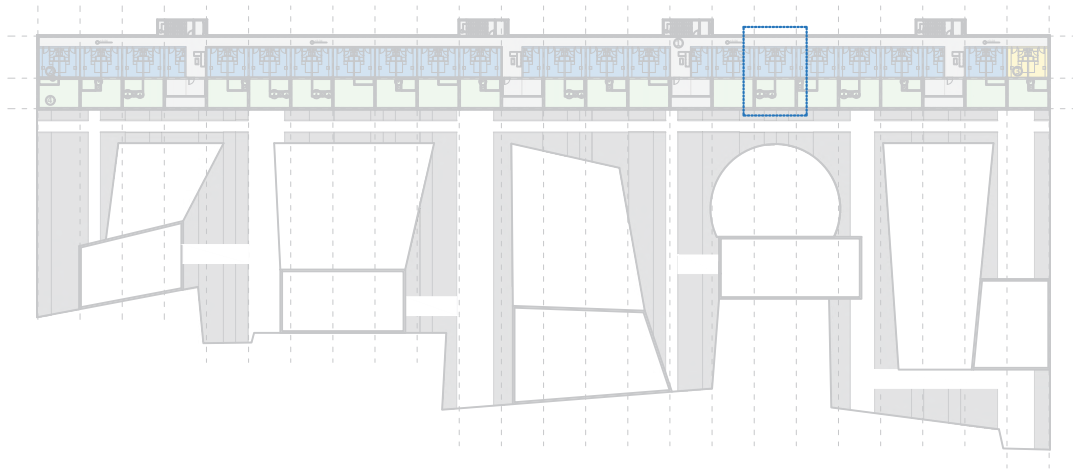


BASEMENT FLOOR PLAN R=1:300



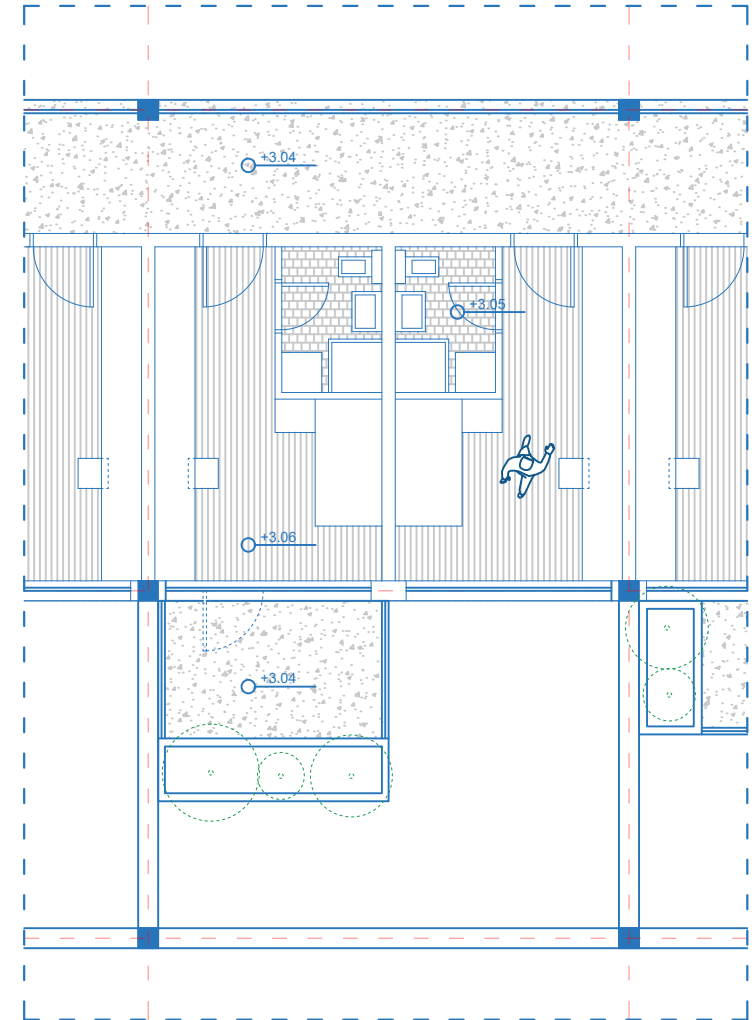
- 0.01_RECOVERY ROOM
- 0.02_MULTIPURPOSE HALL
- 0.03_GYM
- 0.04_ENTERTAINMENT ROOM
- 0.05_KITCHEN FOR ATHLETES
- 0.06_GREEN CORRIDOR
- 0.07_ACCESS ROAD
- 0.08_HALLWAY

FIRST FLOOR PLAN



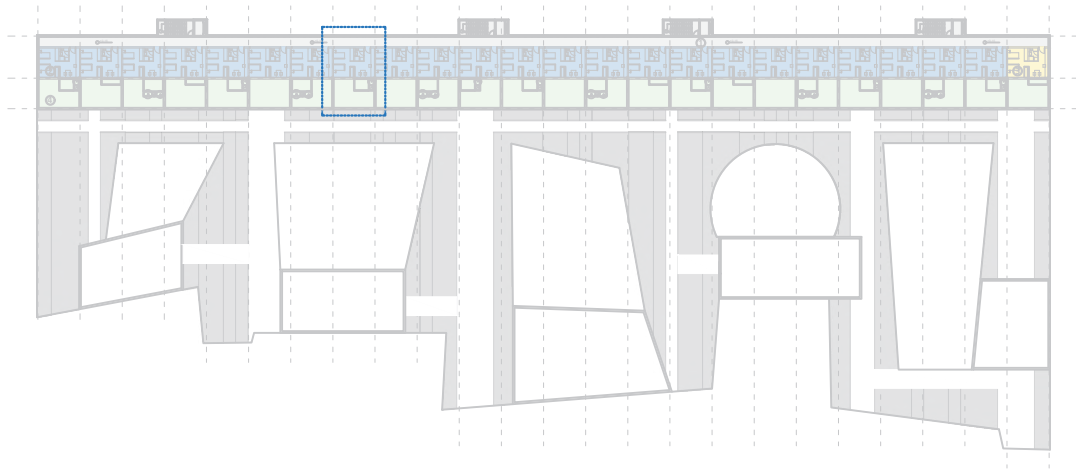
The first-floor layout is identical to the second floor, featuring 42 single-occupancy units alongside 2 supervisor rooms. These units are specifically designed for guests who prefer individual accommodations and private living spaces.

ROOM VIEW 1.2



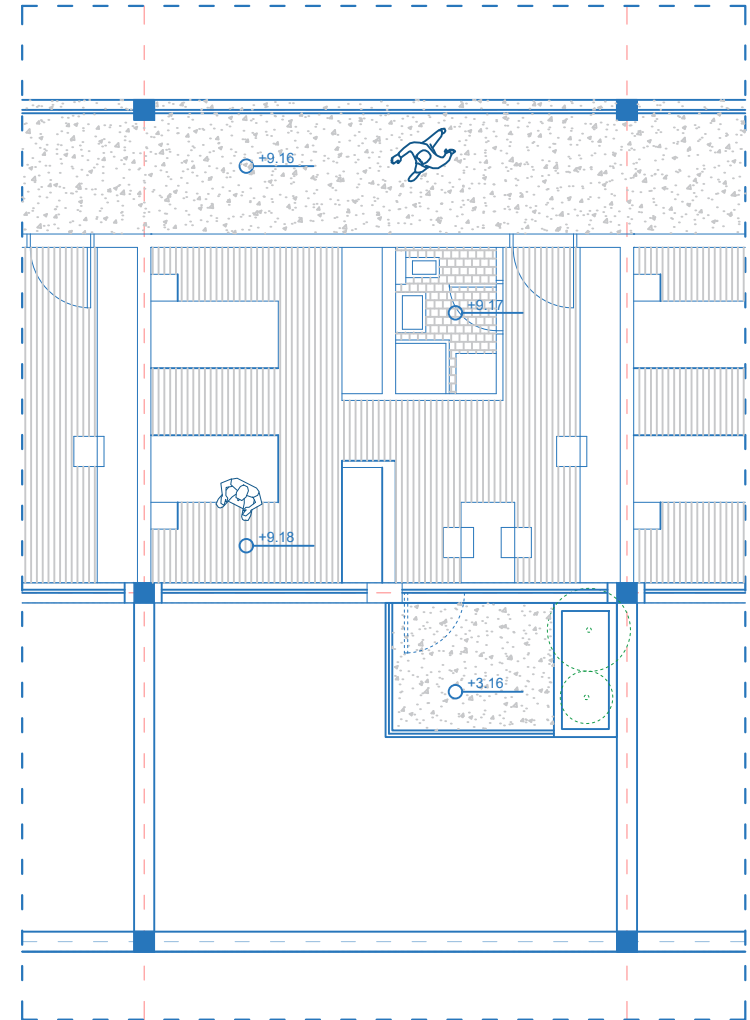
- 1.1 HALLWAY
- 1.2 42 RESIDENTIAL UNITS
- 1.3 2 SUPERVISOR ROOMS
- 1.4 GREEN CORRIDOR

THIRD FLOOR PLAN



The third-floor layout mirrors the configuration of the first and second floors; however, the rooms are designed with greater flexibility. The sleeping units now allow for beds to be joined, catering to individuals seeking more privacy or those traveling with a companion.

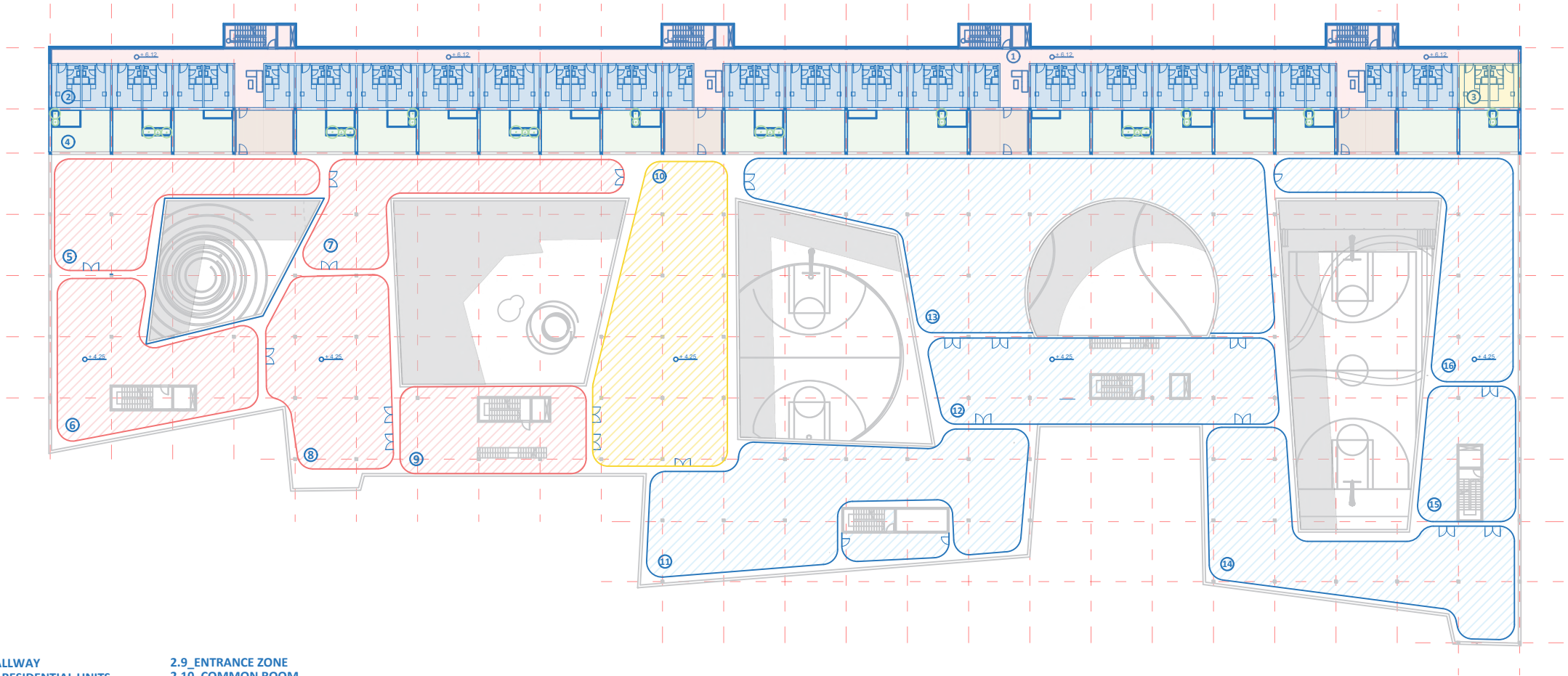
ROOM VIEW 3.2



- 3.1 HALLWAY
- 3.2_23 RESIDENTIAL UNITS
- 3.3_1 SUPERVISOR ROOMS
- 3.4_GREEN CORRIDOR



SECOND FLOOR PLAN R=1:300

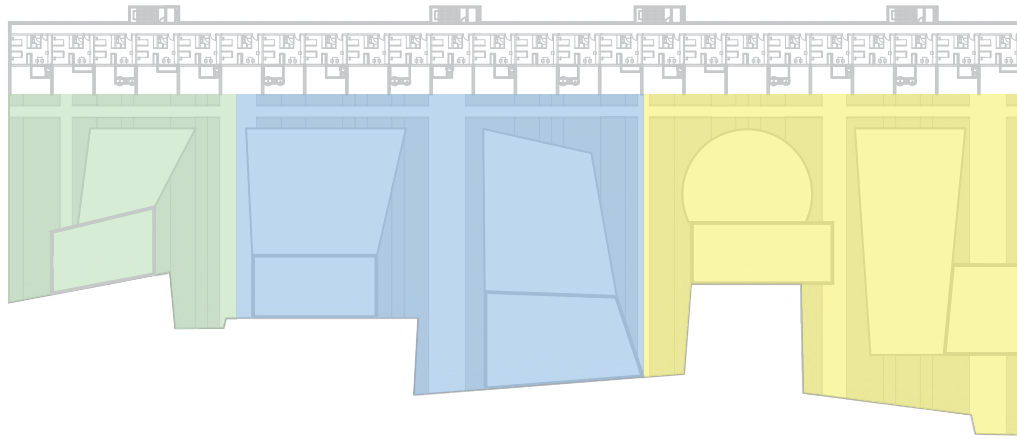


- 2.1_HALLWAY
- 2.2_42 RESIDENTIAL UNITS
- 2.3_2 SUPERVISOR ROOMS
- 2.4_GREEN CORRIDOR
- 2.5_EDUCATIONAL ZONE
- 2.6_ACTIVE ZONE
- 2.7_QUIET ZONE
- 2.8_HYPERACTIVE ZONE

- 2.9_ENTRANCE ZONE
- 2.10_COMMON ROOM
- 2.11_PILATES CENTER
- 2.12_ENTRANCE ZONE
- 2.13_GYM
- 2.14_RECOVERY CENTER
- 2.15_ENTRANCE ZONE
- 2.16_YOGA CENTER







VEGETATION STRATEGY

Resilient Ecological Matrix

The rooftop landscape is designed as a three-part functional ecosystem, transforming the architectural crown into a productive and sensory environment. By organizing the vegetation into three distinct zones Floral, Productive, and Aromatic the project ensures a year-round chromatic identity while fostering a deep, multi-sensory connection between the youth and the natural world.

+ The Chromatic Selection

The primary palette *Juniperus horizontalis*, *Lavandula angustifolia*, *Santolina*, *Iris pumila*, *Knautia macedonica*, and *Euphorbia* acts as the foundational DNA of the site. This selection is a deliberate architectural response to the riverfront's specific microclimate, ensuring that even the productive and aromatic zones follow a strict color logic that mirrors the kinetic energy of the sports complex.

+ Environmental Resilience

Chosen for their ability to withstand the intense riverfront winds and high solar exposure of Belgrade, these high-performance perennials function as a sustainable, low-maintenance thermal envelope. This "living skin" significantly reduces the building's energy footprint and provides a resilient buffer against the urban heat island effect.

+ Three-part Functional Zoning

The roof is organized into three strategic layers of interaction, each reinforcing the project's educational and athletic goals

1. The Floral Canvas (Aesthetic & Biodiversity): Utilizing the full . six-color spectrum, this zone enhances the building's visual identity. It serves as a biodiversity hub, attracting pollinators and creating a vibrant architectural landmark visible from the surrounding urban fabric.

2. The Productive Orchard (Farm-to-Table Education): A zone dedicated to fruit and vegetable cultivation, meticulously organized by color. From Crimson Cherry Tomatoes and Golden Raspberries to Deep Blue Aronia and Vibrant Green Salads, it introduces children to the cycles of food production and the importance of healthy nutrition through "edible architecture."

3. The Aromatic Herbarby (Sensory Therapy): A resilient layer of medicinal and culinary herbs, including Purple Sage, Blue Rosemary, and Red Basil. This zone provides a therapeutic environment for athletes and visitors, utilizing scent and leaf texture to enhance post-training recovery and mental focus.

+ Sensory Education & Urban Renewal

By integrating these productive landscapes, the rooftop transcends its traditional role and becomes a "living classroom." The combination of aromatic scents, varied textures, and seasonal harvests fosters ecological responsibility through direct engagement. This green intervention serves as a symbol of ecological renewal for contemporary Belgrade, transforming the rooftop from a forgotten surface into the dynamic, public heart of the sports complex.



Solanum lycopersicum



Capsicum annum



Vaccinium corymbosum



Aronia melanocarpa



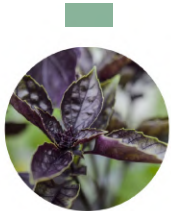
Lactuca sativa



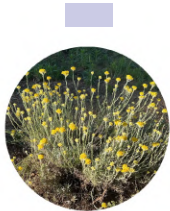
Brassica oleracea



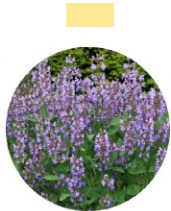
Ocimum basilicum



Helichrysum italicum



Salvia officinalis



Rosmarinus officinalis



Mentha



Allium schoenoprasum



Juniperus horizontalis



Lavandula angustifolia



Santolina chamaecyparissus



Iris pumila

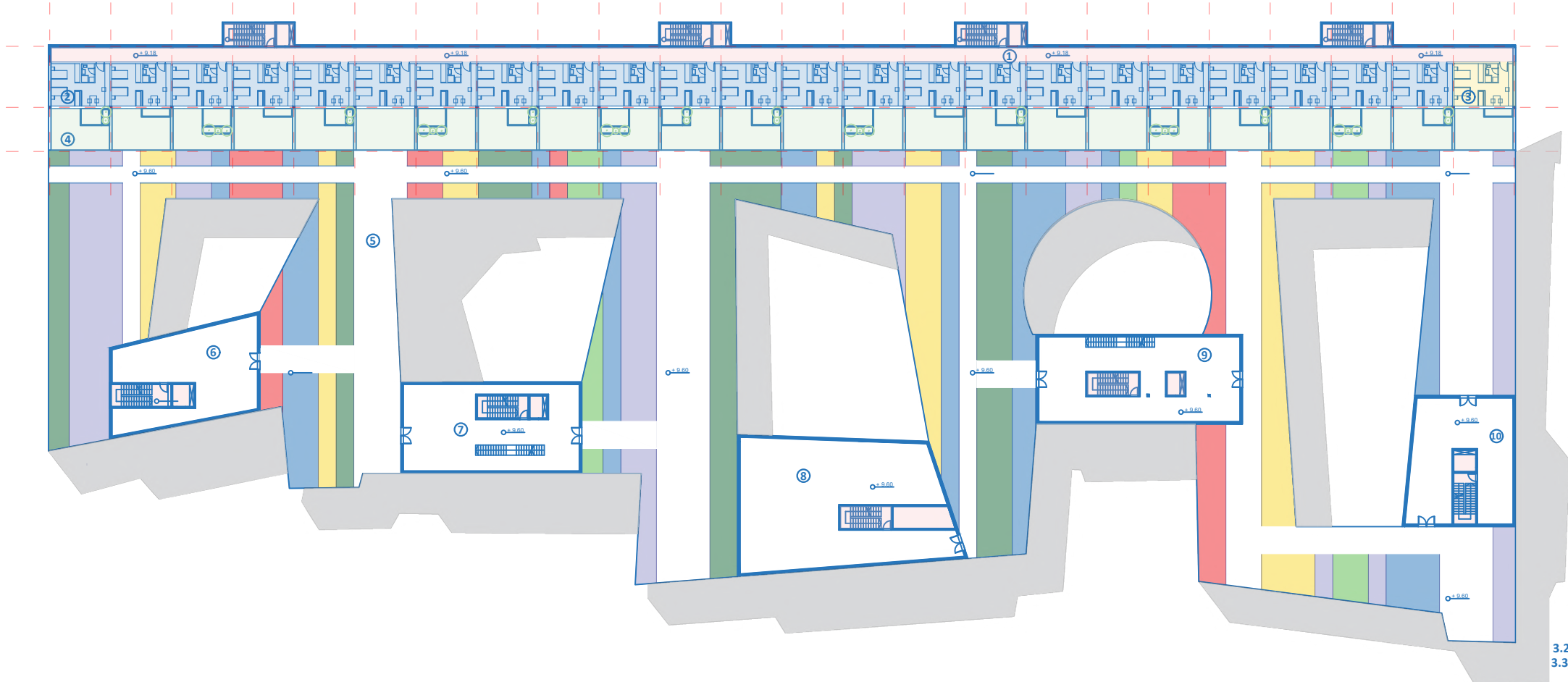


Knautia macedonica



Euphorbia seguieriana





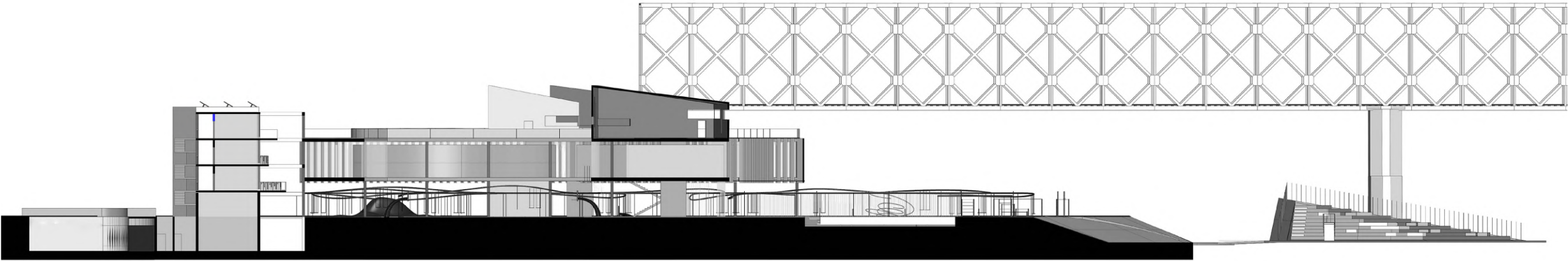
- 3.1 HALLWAY
- 3.2_23 RESIDENTIAL UNITS
- 3.3_1 SUPERVISOR ROOMS
- 3.4_GREEN CORRIDOR
- 3.5_GREEN ROOF
- 3.6_GREENHOUSE
- 3.7_RECEPTION HALL
- 3.8_GREENHOUSE
- 3.9_RECEPTION HALL
- 3.10_GREENHOUSE



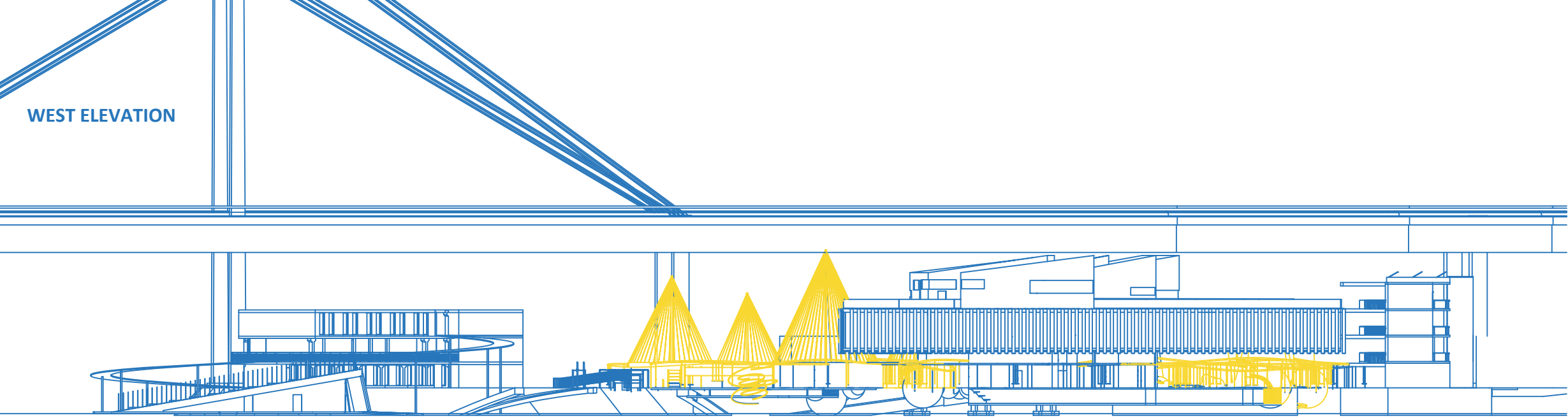
SECTION A-A



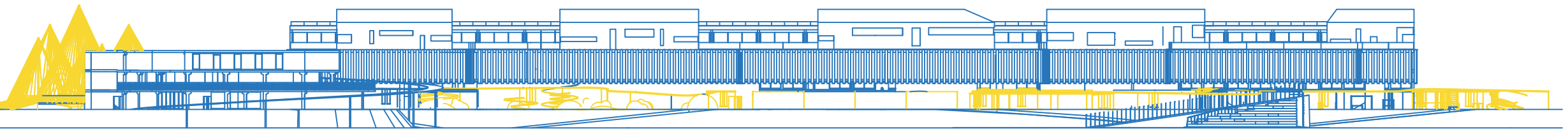
SECTION B-B



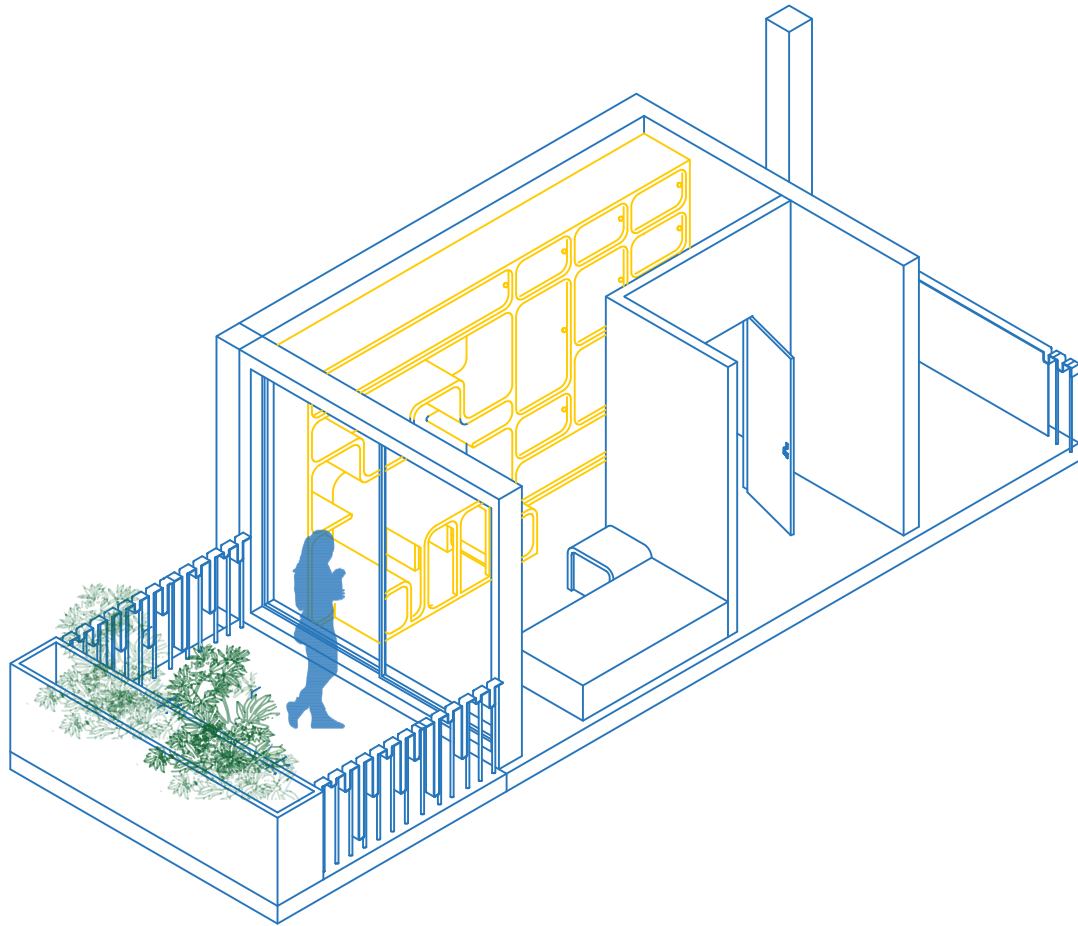
WEST ELEVATION



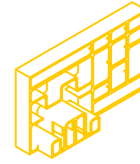
SOUTH ELEVATION



AXONOMETRIC VIEW ROOM



shelf



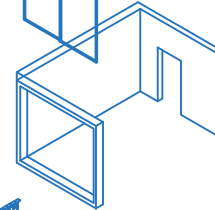
bed



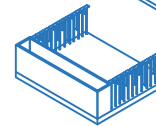
window



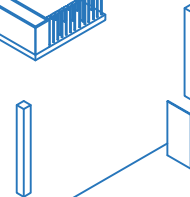
wall panels



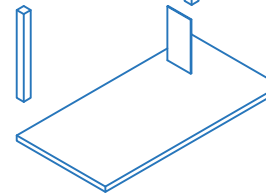
terrace



column



floor panel



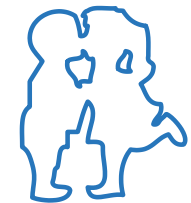
MODULAR SHELF SYSTEM

Instead of just a standard piece of furniture, we designed this modular shelving system to act as the backbone of each housing unit. Running along the main wall, it naturally separates the sleeping area from the open living space. Because we made it deep, the shelf is actually inhabitable featuring carved-out niches for seating, workspaces, and storage that blur the line between furniture and architecture.

The system relies on a flexible, modular design that works perfectly across the different units for athletes and the academic sailing club. It maintains a consistent, unified look throughout the complex, while still letting residents customize the shelves to fit their specific needs.

The shape of the shelving is inspired by a "meander" a continuous, flowing line that conceptually connects the secondary schools and kindergartens across New Belgrade. We brought this flowing energy indoors using rounded corners and seamless, continuous lines. This curvature softens the otherwise boxy layout of the apartments, giving the space a natural sense of rhythm and movement.

Ultimately, the shelving system does double duty: it's a highly functional, adaptable tool for everyday living, but it also physically connects the interior of the complex to the broader story of the city outside.



DEVELOPMENT OF PREFABRICATED HOUSING UNIT

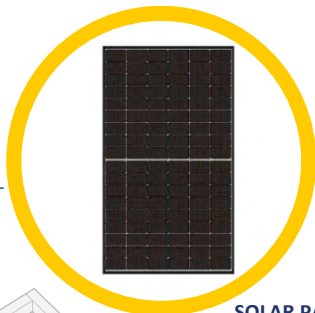
Details



FACADE WALL PANEL LAYERS

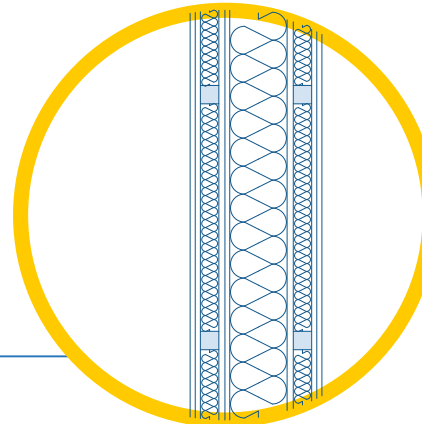
- Timber facade cladding (perforated/slatted) – 19 mm
- Timber facade subframe / ventilated air cavity – 22 mm
- Windproof membrane Isover Vario Fassade – 0.5 mm
- External thermal insulation Isover Multimax 30 – 150 mm
- Rigid sheathing OSB 3 board – 15 mm
- Timber frame construction 240 mm / Isover Uniroll Plus infill – 240 mm
- Smart vapour barrier Isover Vario KM Duplex UV – 0.3 mm
- Service zone / subframe / Isover FireProtect mineral wool – 50 mm
- Interior lining Rigips Rigitone R 8/18 Q Climafit – 10 mm
- Finishing layer Weber.ton acrylic paint

$U = 0.085 \text{ W/m}^2\text{K}$



SOLAR PANELS

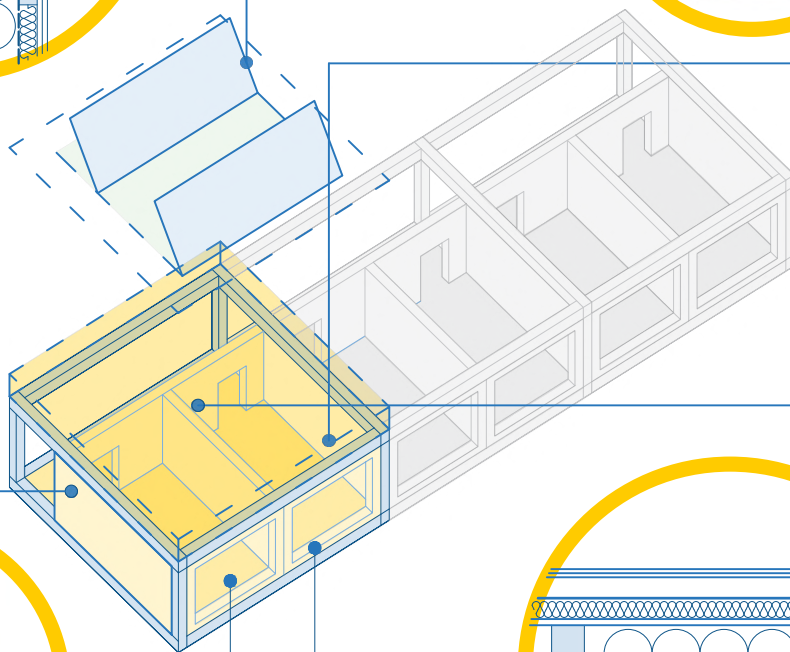
The roof features 255 Jinko Tiger Neo N-Type photovoltaic panels (102 kWp) utilizing TOPCon technology to achieve 22% efficiency for maximum renewable energy generation.



PARTITION WALL PANEL LAYERS

- Rigips Blue Acoustic RF - 2 x 12.5 mm
- Substructure for gypsum boards / Isover FireProtect - 50 mm
- OSB 3 board - 15 mm
- Timber structural frame 140 mm / Isover Uniroll Plus infill - 140 mm
- OSB 3 board - 15 mm
- Substructure / Isover FireProtect - 50 mm
- Rigips Blue Acoustic RF - 2 x 12.5 mm

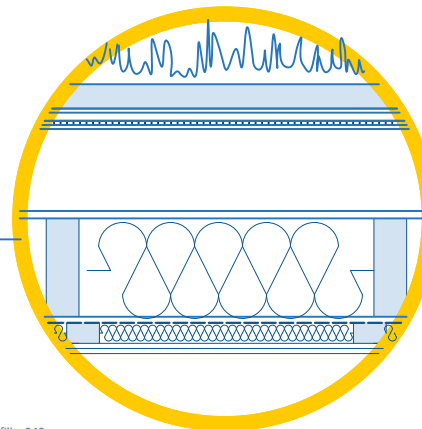
$U = 0.16 \text{ W/m}^2\text{K}$
 $R_w = 60-65 \text{ dB}$



ROOF PANEL LAYERS

- Vegetation layer (sedum) – 50–100 mm
- Growing medium / substrate – min. 60 mm
- Filter layer (geotextile) – 5 mm
- Drainage and water storage layer – 20 mm
- Protection fleece (mechanical protection) – 10 mm
- Root-resistant waterproofing membrane – 10 mm
- OSB board (sloped substrate) – 18–22 mm
- Timber roof structure 240 mm / Isover Uniroll Plus infill – 240 mm
- Vapour barrier Isover Vario KM Duplex UV – 0.3 mm
- Ceiling subframe / Isover FireProtect – 50 mm
- Fire-resistant and acoustic lining Rigips Blue Acoustic RF – 2 x 12.5 mm

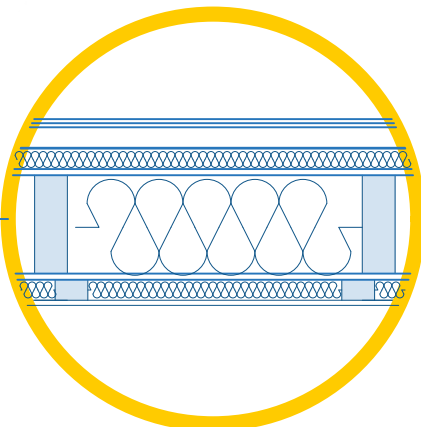
$U = 0.11 \text{ W/m}^2\text{K}$



FLOOR PANEL LAYERS

- Finished flooring (timber parquet) – 20 mm
- Self-levelling cement screed Weber.floor 4310 – 40 mm
- Separation layer PE foil / Isover Akustic – 2 mm
- Impact sound insulation Isover TDPT – 50 mm
- Load distribution layer OSB board – 15 mm
- Load-bearing timber beams 240 mm / Isover Uniroll Plus infill – 240 mm
- Bottom structural lining OSB board – 15 mm
- Ceiling service zone / subframe / Isover FireProtect – 50 mm
- Acoustic ceiling lining Rigips Rigitone R 8/18 Q Climafit – 10 mm

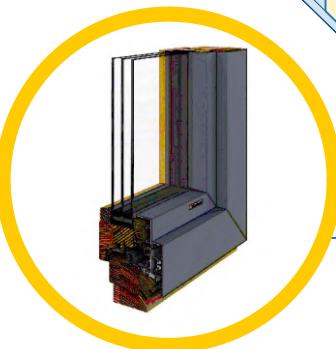
$U = 0.135 \text{ W/m}^2\text{K}$



WINDOW

To complement the CLT structure, Gaulhofer INULINE 92 timber windows are equipped with Saint-Gobain triple-pane high-performance glass, achieving a certified Passive House thermal transmittance of

$U = 0.73 \text{ W/(m}^2\text{K)}$



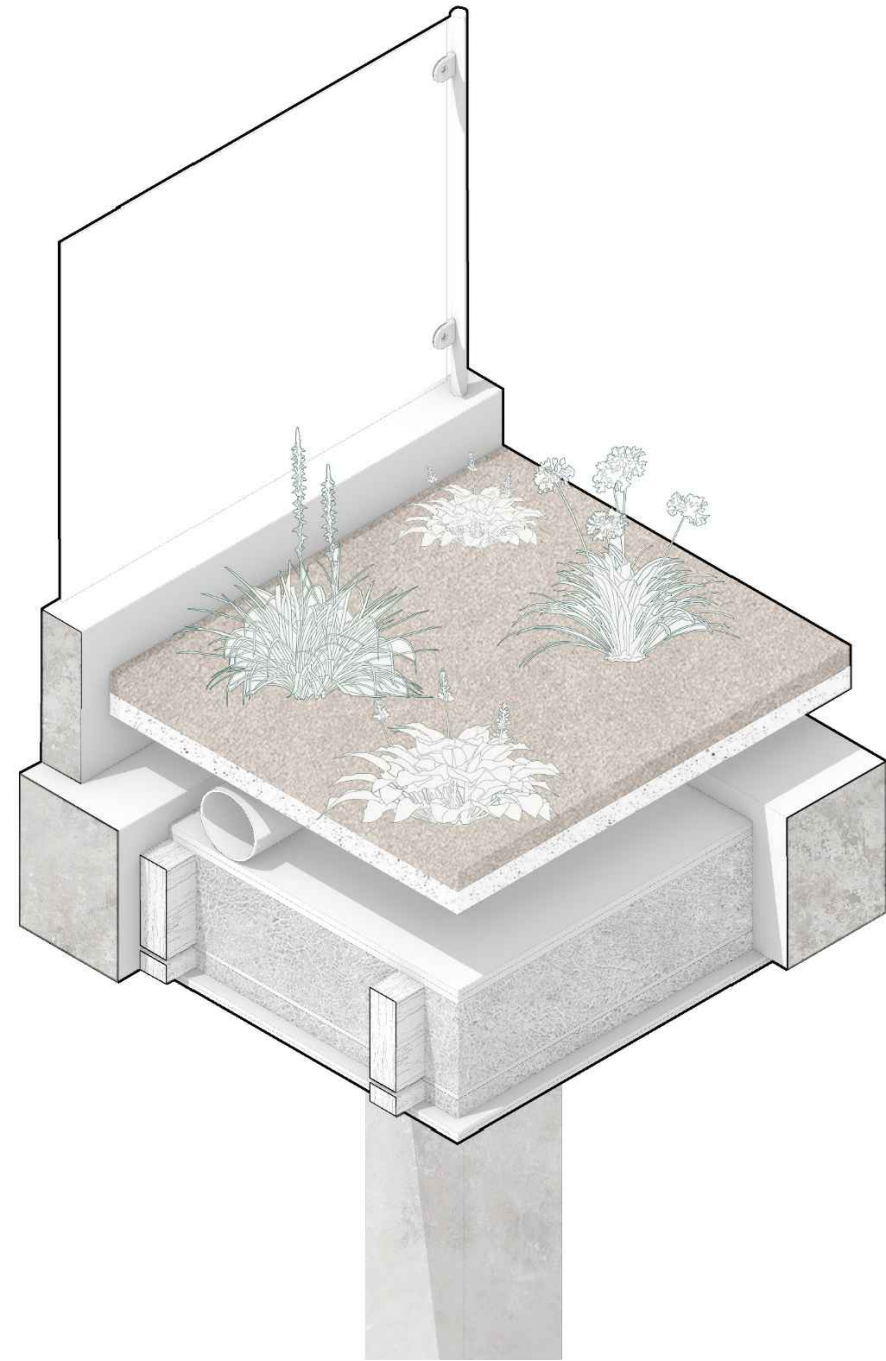
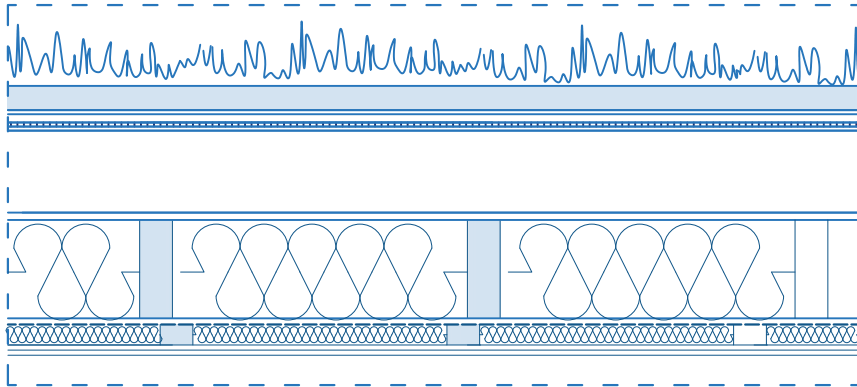


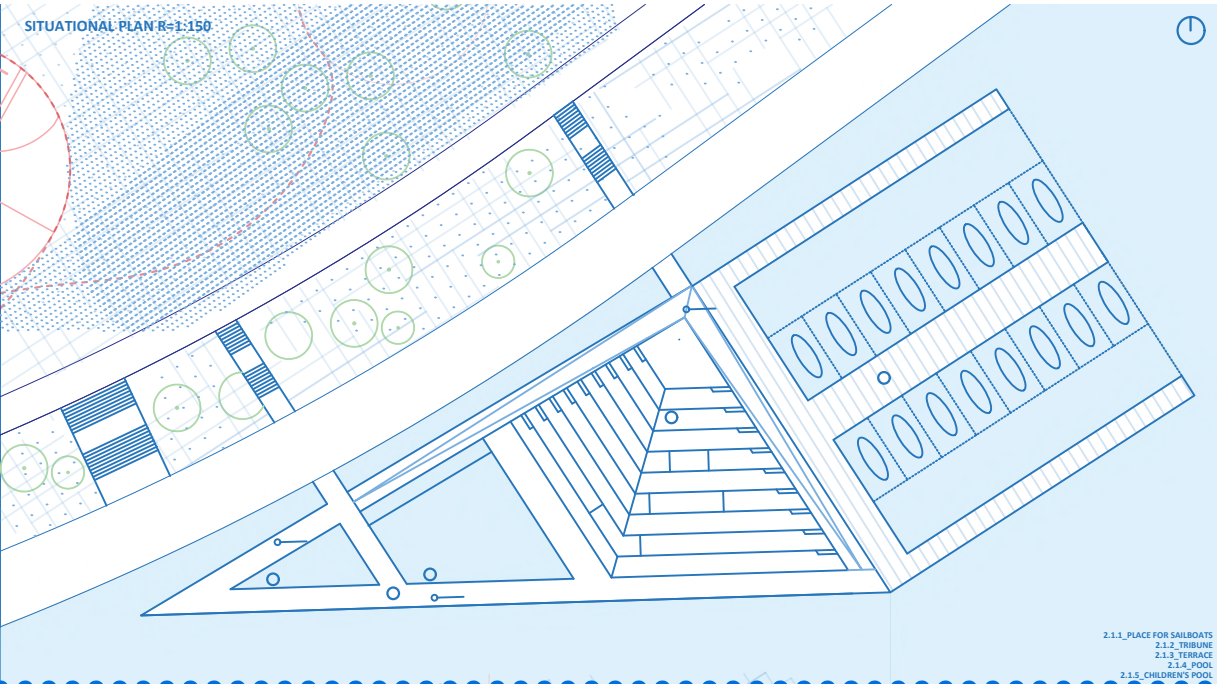


ROOF PANEL LAYERS

- Vegetation layer (sedum) – 50–100 mm
- Growing medium / substrate – min. 60 mm
- Filter layer (geotextile) – 5 mm
- Drainage and water storage layer – 20 mm
- Protection fleece (mechanical protection) – 10 mm
- Root-resistant waterproofing membrane – 10 mm
- OSB board (sloped substrate) – 18–22 mm
- Timber roof structure 240 mm / Isover Uniroll Plus infill – 240 mm
- Vapour barrier Isover Vario KM Duplex UV – 0.3 mm
- Ceiling subframe / Isover FireProtect – 50 mm
- Fire-resistant and acoustic lining Rigips Blue Acoustic RF – 2 x 12.5 mm

U ≈ 0.11 W/m²K





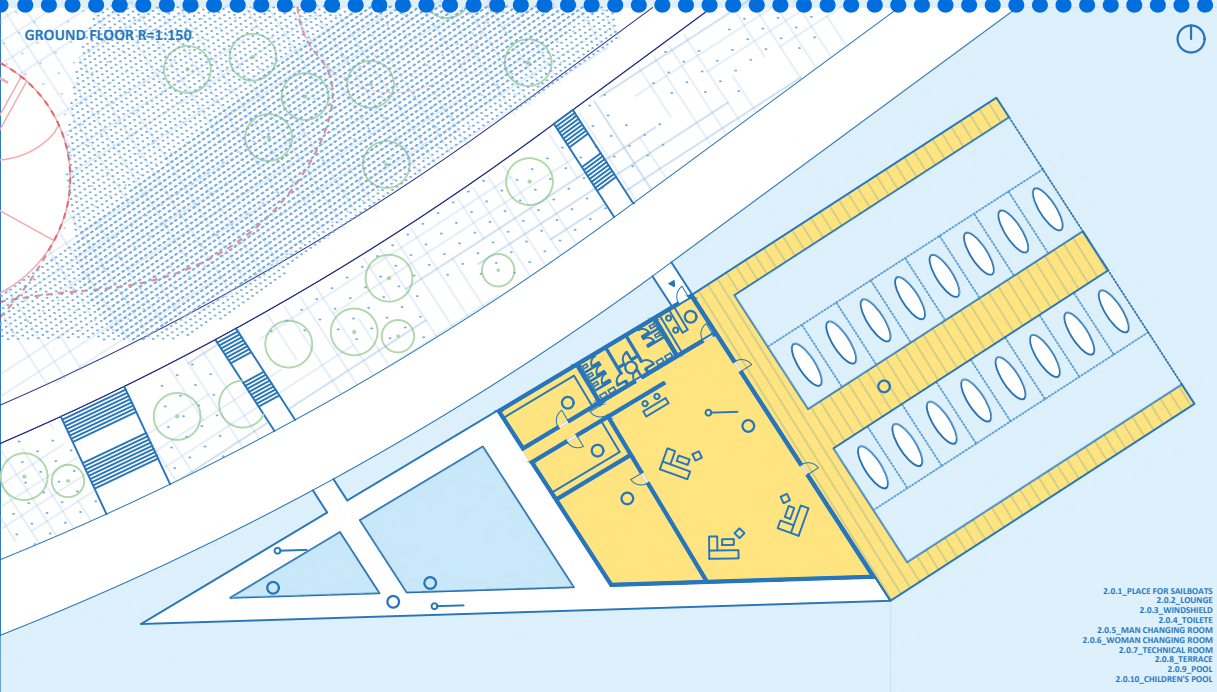
CONCEPT EVOLUTION - FLOATING PLATFORM

Diagram



Initial form

Spatial development



- 2.1.1 PLACE FOR SAILBOATS
- 2.1.2 TRIBUNE
- 2.1.3 TERRACE
- 2.1.4 POOL
- 2.1.5 CHILDREN'S POOL

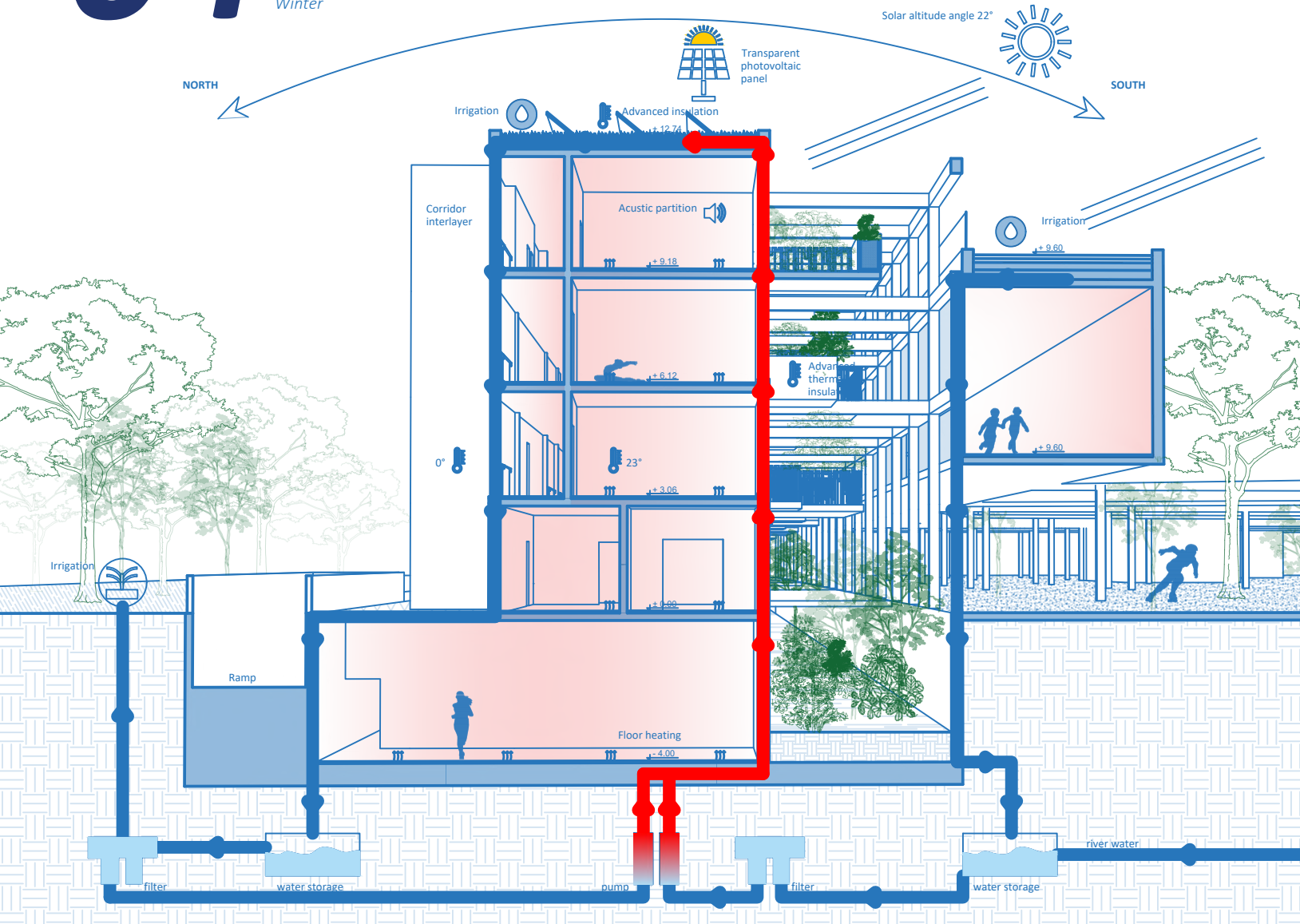
- 2.0.1 PLACE FOR SAILBOATS
- 2.0.2 LOUNGE
- 2.0.3 WINDSHIELD
- 2.0.4 TOILET
- 2.0.5 MAN CHANGING ROOM
- 2.0.6 WOMAN CHANGING ROOM
- 2.0.7 TECHNICAL ROOM
- 2.0.8 TERRACE
- 2.0.9 POOL
- 2.0.10 CHILDREN'S POOL

Roof activation

Formation of tribunes

04

ENERGY EFFICIENCY Winter



ENERGY EFFICIENCY

Resilient Ecological Matrix

+ Geothermal Heating & Radiant Comfort

During the winter months, the system utilizes the Sava River as a stable energy source. The water-to-water heat pumps extract thermal energy to power radiant floor and wall heating. This creates a healthy, draft-free environment by heating surfaces rather than air, which is crucial for preventing respiratory issues and dust circulation in high-intensity sports zones.

+ High-Mass Thermal Storage

The hybrid construction strategy maximizes heat retention. The concrete skeleton acts as a "thermal battery," absorbing internal gains and slowly releasing them. This is complemented by the Zero-Carbon CLT modules and high-spec insulation, which provide a thick, breathable barrier against the cold. The triple-pane, low-e glass acts as a transparent thermal shield, allowing solar gain while preventing heat leakage.

+ Organic Roof Insulation

The soil and vegetation of the tripartite green roof function as a natural insulation layer. This organic mass protects the building's crown from the freezing Belgrade winds, significantly reducing the energy required to maintain a stable internal temperature for the children's center.

Based on the domestic regulation, building for student housing achieves **A energy rating**, based on the parameter of energy need for heating resulting in **14.86 kWh/m²/a**. This is achieved through very rational shape and volume (area to volume ratio of only 0.5), passive standard thermal envelope (mean U value of 0.3) and excessive passive solar gains.

ENERGIJA POTREBNA ZA GREJANJE (razlika između gubitaka i dobitaka)









$Q_{h,nd} = 71002.45 \text{ kWh}$

Energija potrebna za grejanje po m²

$Q_{h,an} = 14.86 \text{ kWh/m}^2\text{a}$

6.3 Energetski razred

Za usvajanje energetskog razreda koristi se specifična godišnja energija potrebna za grejanje za sisteme koji rade bez prekida

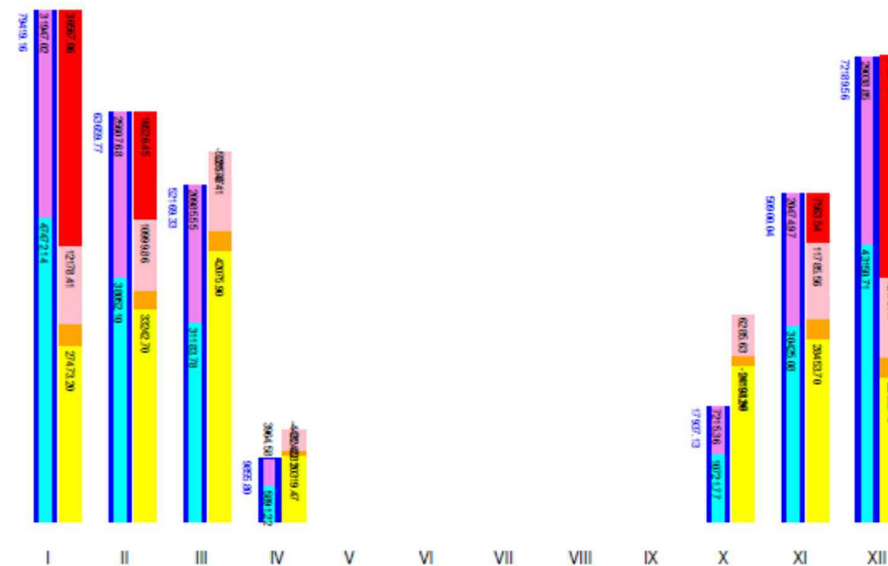
En. razred	$Q_{h,rel} = 24.8 \%$	$Q_h = 14.86 \text{ kWh/m}^2$
A+ 	≤ 15	≤ 9
A 	≤ 25	≤ 15
B 	≤ 50	≤ 30
C 	≤ 100	≤ 60
D 	≤ 150	≤ 90
E 	≤ 200	≤ 120
F 	≤ 250	≤ 150
G 	> 250	> 150

Na osnovu energije potrebne za grejanje po m², objekat spada u A energetski razred

6. ENERGETSKE POTREBE ZGRADE

6.1 Energetski bilans po mesecima

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Te =	1.3	3.4	7.7	13.0	18.0	21.1	22.7	22.2	18.1	13.1	7.6	3.0
HDD = 2520.00	578.210	463.474	379.818	71.755	0.000	0.000	0.000	0.000	0.000	130.591	370.577	525.575
HD = 175	31	28	31	8	0	0	0	0	0	16	30	31
Te.hd =	1.348	3.447	7.748	11.031	0.000	0.000	0.000	0.000	0.000	11.838	7.647	3.046
1. Q _t =206.90 MWh	47.47	38.05	31.18	5.89	0.00	0.00	0.00	0.00	0.00	10.72	30.43	43.15
2. Q _v =139.23 MWh	31.95	25.61	20.99	3.96	0.00	0.00	0.00	0.00	0.00	7.22	20.47	29.04
3. Q _{t+Qv} =346.13 MWh	79.42	63.66	52.17	9.86	0.00	0.00	0.00	0.00	0.00	17.94	50.90	72.19
4. Q _{sol} =188.31 MWh	27.47	33.24	42.08	10.32	0.00	0.00	0.00	0.00	0.00	24.19	28.45	22.55
5. Q _p =18.07 MWh	3.20	2.89	3.20	0.83	0.00	0.00	0.00	0.00	0.00	1.65	3.10	3.20
6. Q _{el} =68.75 MWh	12.18	11.00	12.18	3.14	0.00	0.00	0.00	0.00	0.00	6.29	11.79	12.18
7(4+5+6): Q _{gn} =275.13 MWh	42.85	47.13	57.45	14.29	0.00	0.00	0.00	0.00	0.00	32.13	43.34	37.93
8(3-7): Q _{nd} =71.00 MWh	36.57	16.53	-5.29	-4.43	0.00	0.00	0.00	0.00	0.00	-14.19	7.56	34.26



Energy analysis Tool:



UK Research and Innovation



ACTIVE BUILDING CENTRE RESEARCH PROGRAMME

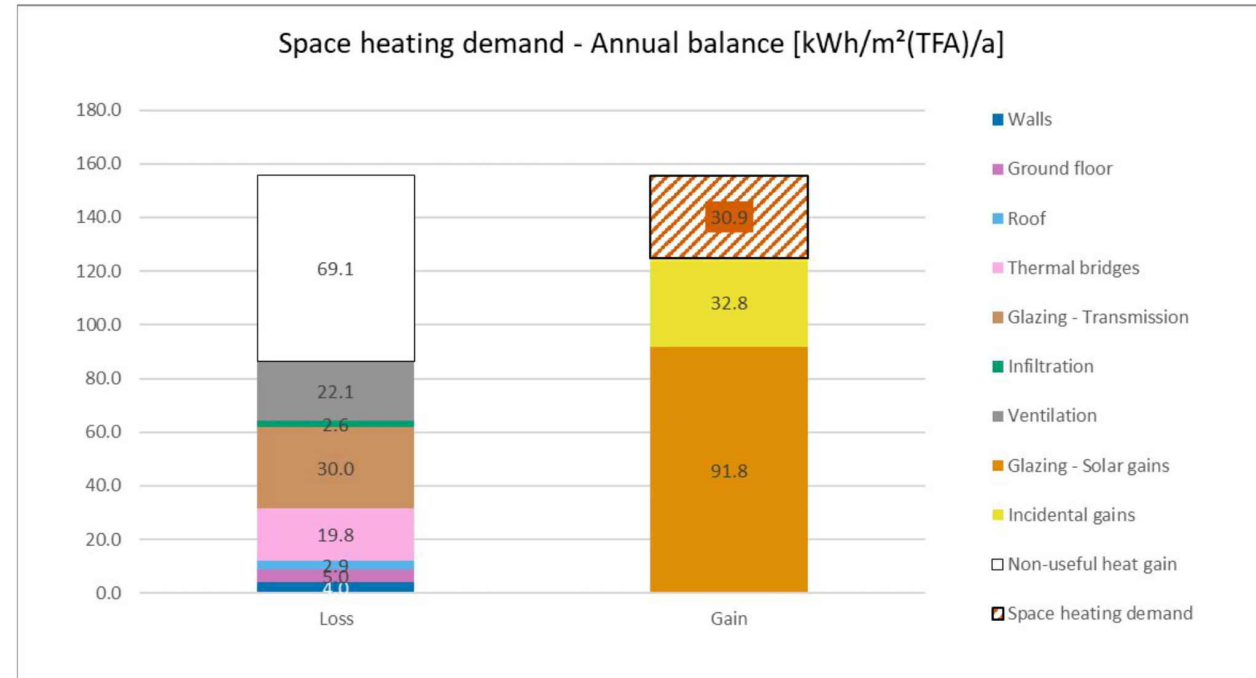
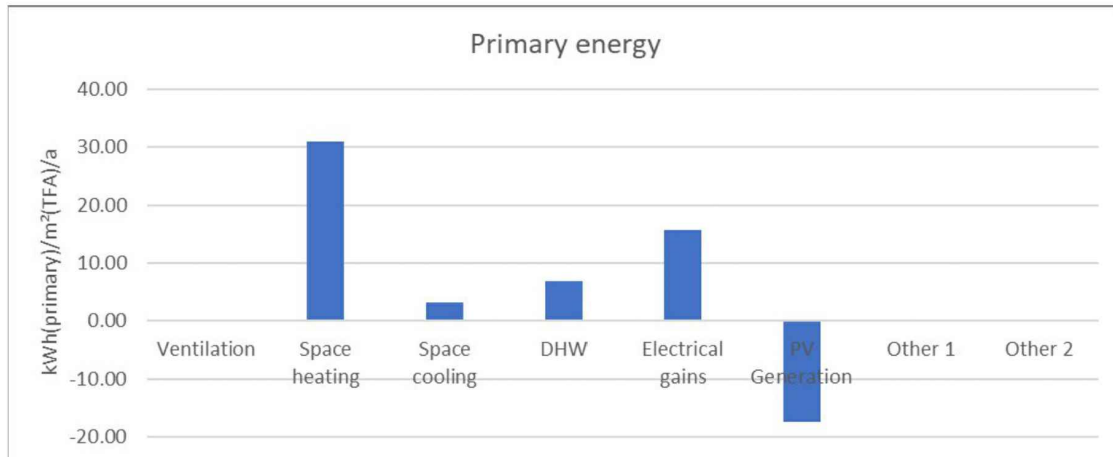


UNIVERSITY OF BATH

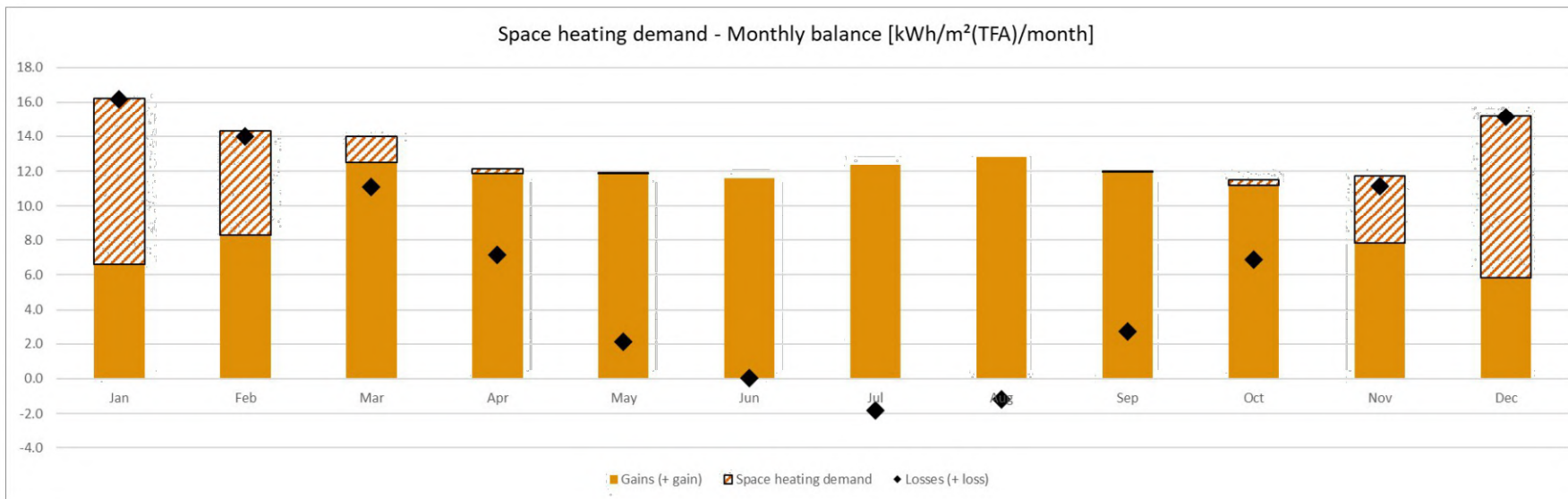
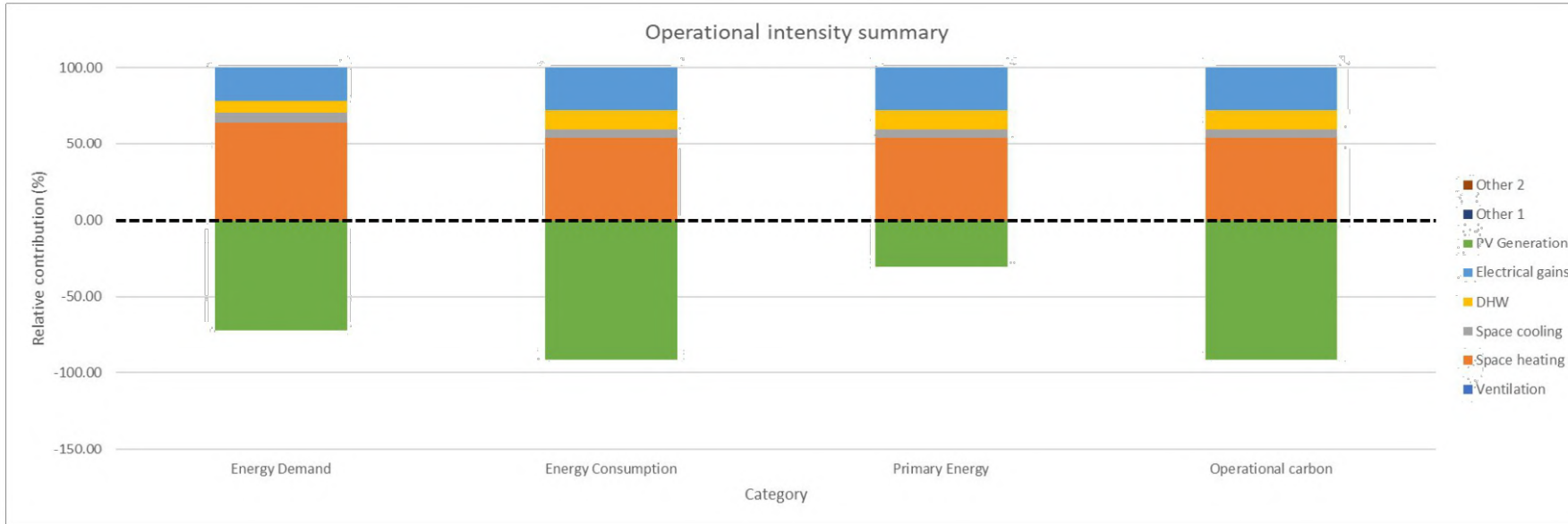


Taking into account total ENERGY BALANCE using ZEBRA (Zero Energy Building Reduced Algorithm)

- Primary energy – 56.8 kWh/m²(TFA)/a
- Net primary energy – 39.4 kWh/m²(TFA)/a
- Net operational carbon – 0.4 kgCO₂e/m²(TFA)/a
- Space heating demand - 30.9 kWh/m²(TFA)/a
- Space cooling demand - 3.1 kWh/m²(TFA)/a



Energy analysis key OUTPUTS



LCA analysis

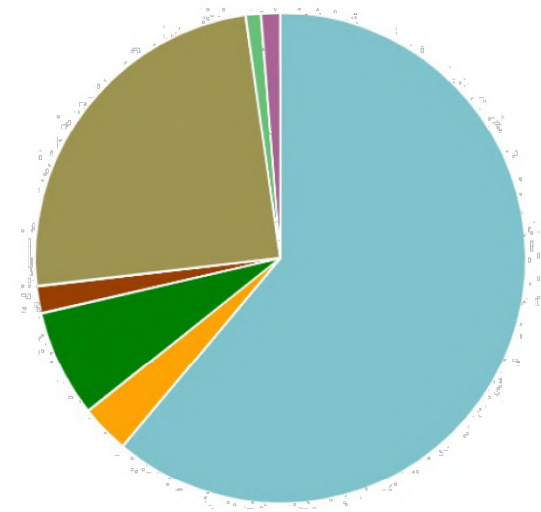


By selecting over 80% of locally and nearby produced materials influence of transport is significantly reduced!

Global Warming Potential total kg CO₂e - Life-cycle stages

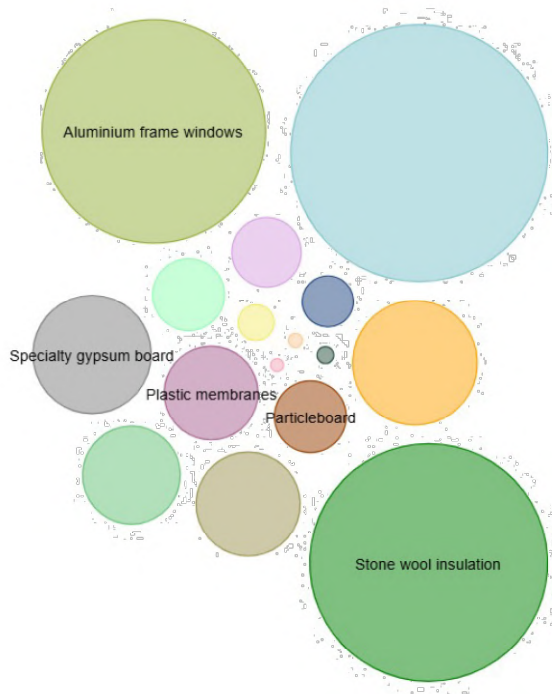
- A1-A3 Materials - 61.1%
- A4 Transport - 3.2%
- A5 Construction - 7.1%
- C2 Waste transport - 1.7%
- C3 Waste processing - 0.0%
- C3-balancing Biogenic waste processing - 24.5%
- C4 Waste disposal - 1.0%
- C4-balancing Biogenic waste disposal - 1.3%

Cradle to grave (A1-A4, B4-B5, C1-C4)	kg CO ₂ e/m ²
(< 315) A	<div style="font-size: 2em; font-weight: bold;">231</div>
(315-400) B	
(400-485) C	
(485-570) D	
(570-655) E	
(655-740) F	
(> 740) G	



Bubble chart, total life-cycle impact by resource type and subtype, Global Warming Potential total

Hover your mouse over legends or the chart to highlight impacts. Bubble minimum and maximum sizes constrained for readability

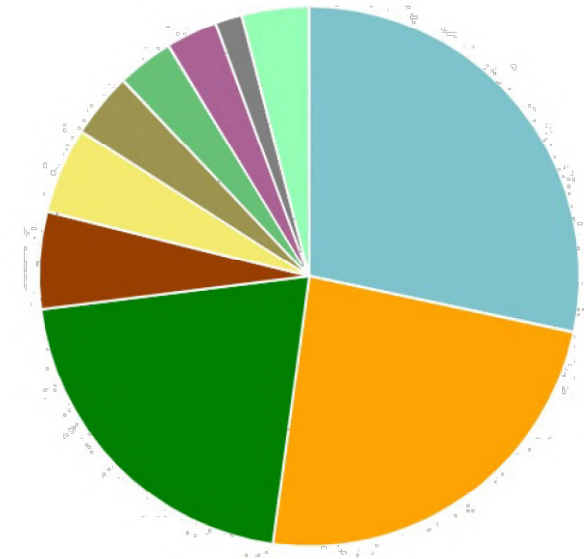


Materials and components with highest impact

Global Warming Potential total kg CO2e - Resource types

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

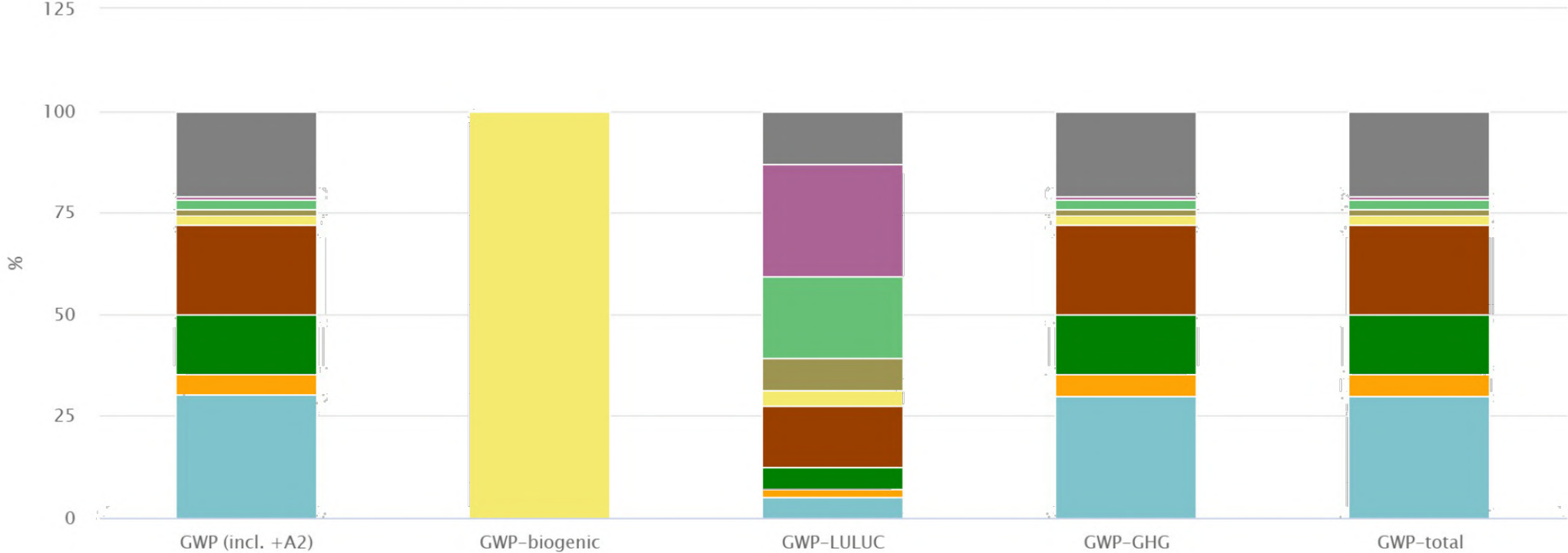
- Ready-mix concrete for foundations and internal walls - 28.3%
- Stone wool insulation - 23.9%
- Aluminium frame windows - 20.9%
- Ready-mix concrete for structures (beams, columns, piling) - 5.8%
- Specialty gypsum board - 5.2%
- Plain wood/timber (softwood and hardwood) - 3.9%
- Reinforcement for concrete (rebar) - 3.4%
- Plastic membranes - 3.1%
- Particleboard - 1.6%
- Other resource types - 4.0%



Graphs Level(s) life-cycle carbon (EN15804 +A1/+A2)

Life-cycle impacts by material as stacked columns

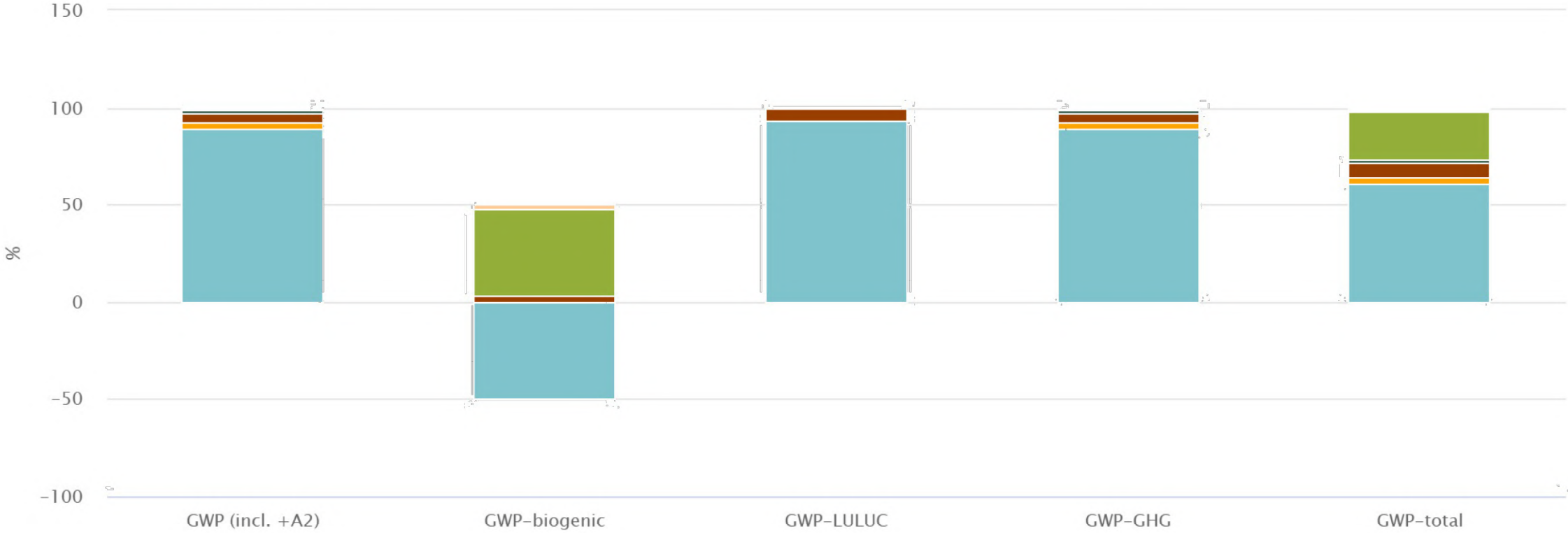
- Ready-mix concrete
- Stone wool insulation for flat roofs, unfaced
- Rock mineral wool insulation slab, unfaced, uncoated
- Softwood lath (stud), kiln dried, planed
- Other items
- Stone wool insulation for floating floors, unfaced
- Wood-aluminium framed window, calculated average for Croatia
- Wood particleboard
- Wooden interior door without glass



Graphs Level(s) life-cycle carbon (EN15804 +A1/+A2)

Life-cycle impacts by stage as stacked columns

- A1-A3 Materials
- A4 Transport
- A4-leg2 Transport leg 2
- A5 Construction
- B2 Maintenance
- B3 Repair
- B4-B5 Replacement
- B6 Energy
- B7 Water
- C1 Deconstruction/demolition
- C2 Waste transport
- C3 Waste processing
- C3-balancing Biogenic waste processing
- C4 Waste disposal
- C4-balancing Biogenic waste disposal
- B1 Use phase



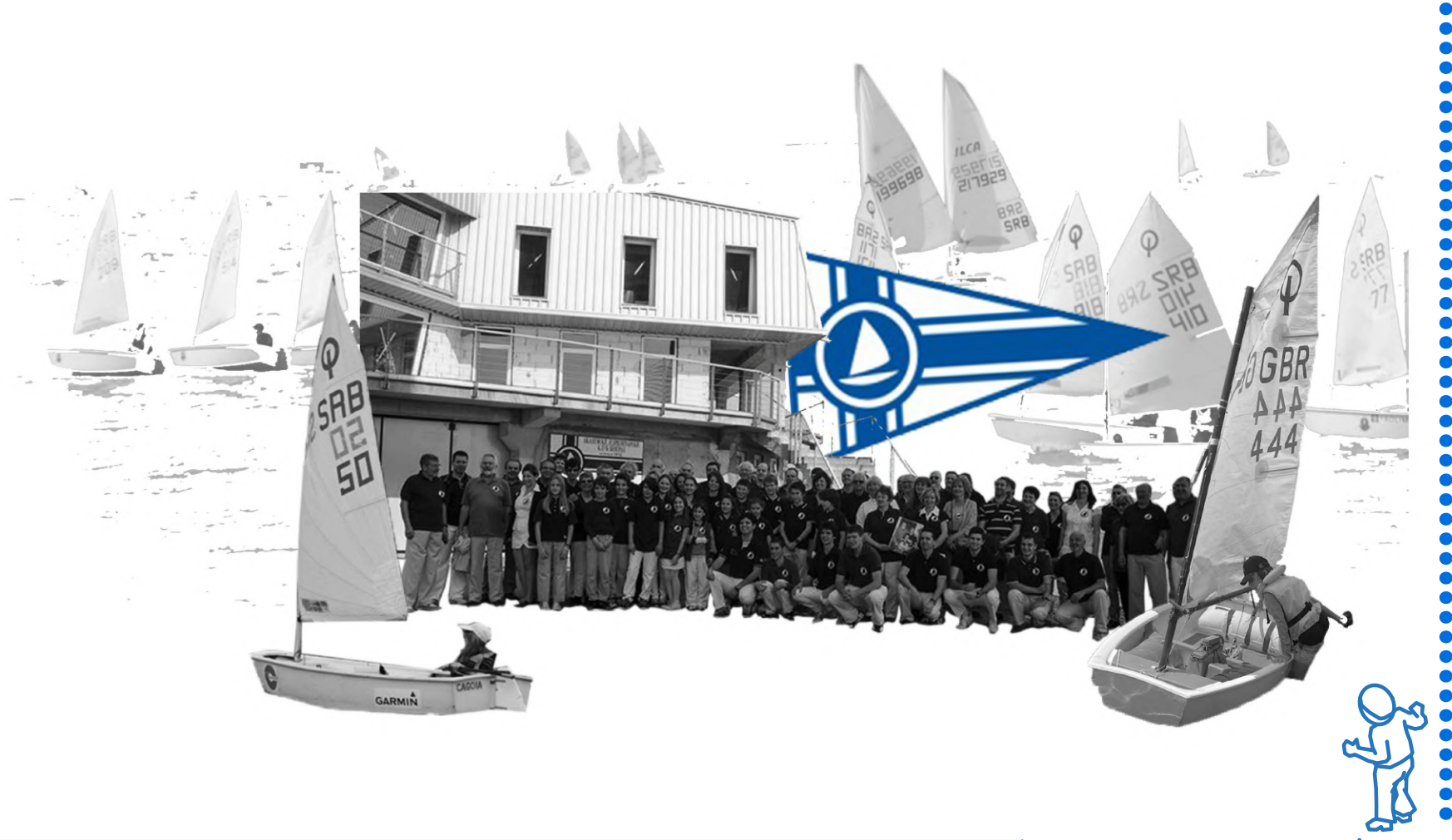
05

RENOVATION BUILDING



05

ANALYSIS
Renovation Project



ACADEMIC SAILING CLUB

Historical Landmark and Spatial Potential

+ 1934 Establishing a Tradition

The Academic Sailing Club Belgrade, founded in 1934, is the oldest institution of its kind in the city. Over decades, the club has profiled itself as a key bearer of the sporting spirit and an educational center for generations of sailors, inextricably linked to the Sava River as a primary natural resource.

+ 2008 Disposition at the New Location

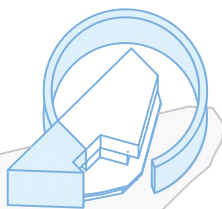
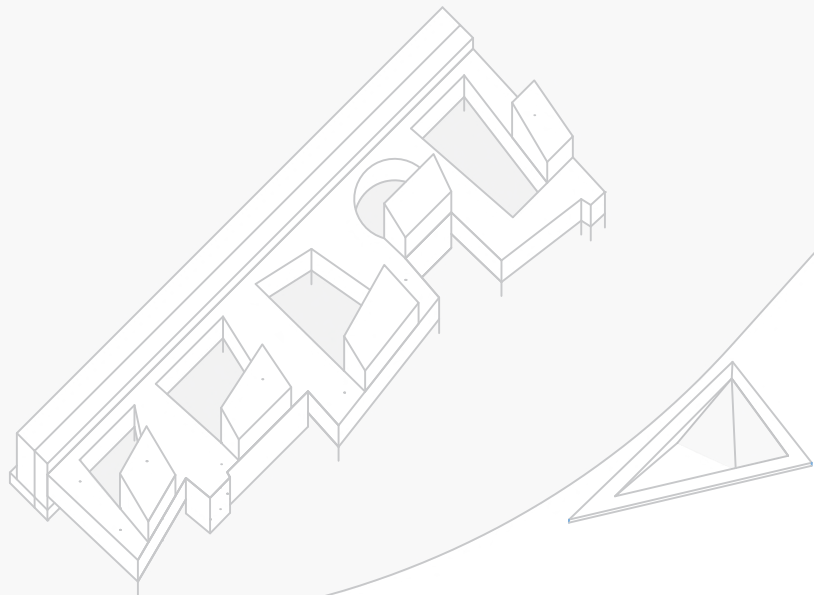
Due to infrastructural changes (construction of the Ada Bridge), the club was dislocated to its current position an elongated peninsula along the Sava. Although the new location offers superior, direct contact with the water and the possibility of age-based zoning, the building itself remained spatially and functionally incomplete.

+ 2026 Synthesis of Challenges and Vision for Development

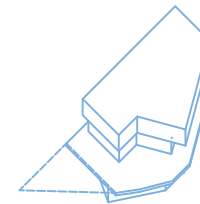
Today, the club is characterized by a pronounced discrepancy between its strong historical legacy and inadequate, fragmented spatial capacities. Radical modernization, flow reorganization, and programmatic opening to the general public are essential. The key developmental potential lies in the architectural strengthening of the connection with the riverfront, the implementation of new, hybrid programs, and the creation of a contemporary, polycentric hub that unites elite sport, ecological education, and community cohesion.

CONCEPT EVOLUTION - EXISTING BUILDING

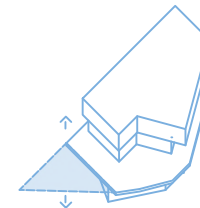
Diagram



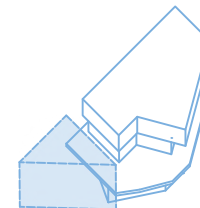
Extension Zone



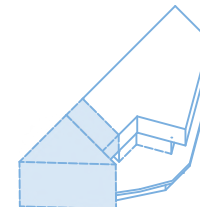
Volume creation



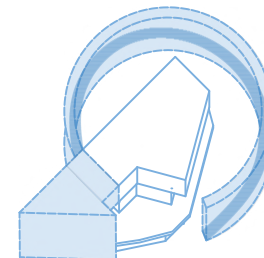
Form definition



Connection



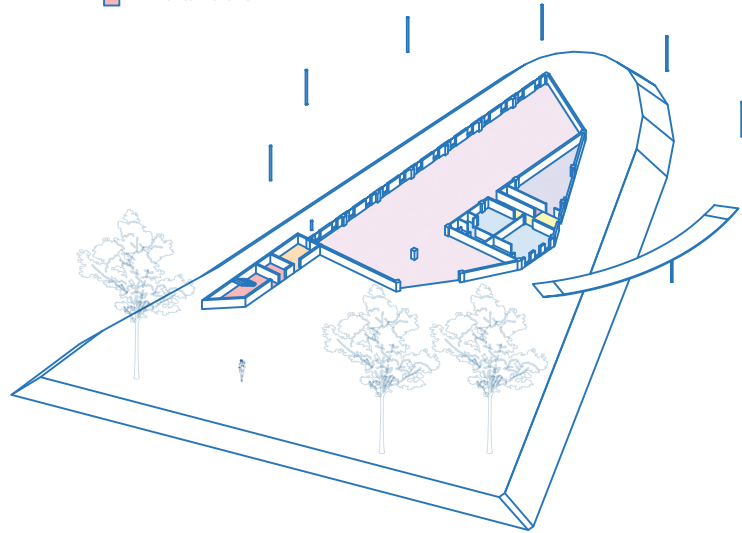
Outer Frame and Final form



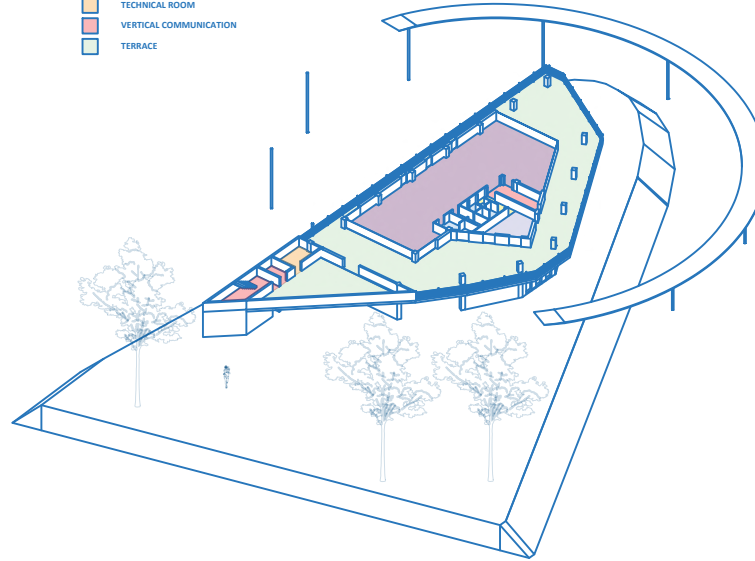
FUNCTIONAL VIEW OF THE OBJECT

Diagram

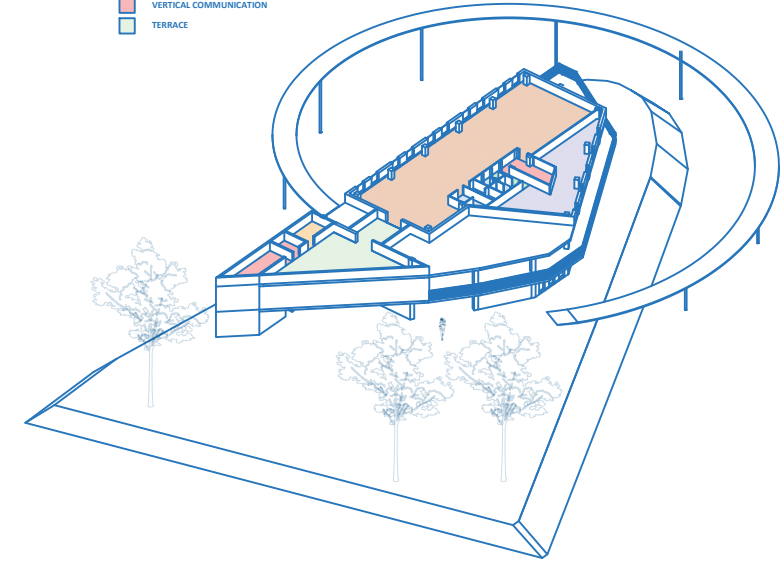
- CORRIDOR
- MEN LOCKER ROOM
- WOMEN LOCKER ROOM
- COMMON ROOM
- SAILBOAT ACCOMMODATION SPACE
- TECHNICAL ROOM
- VERTICAL COMMUNICATION



- CORRIDOR
- CLUB OFFICE
- OFFICE TOILET
- GYM TOILET
- MULTIFUNCTIONAL HALL
- TECHNICAL ROOM
- VERTICAL COMMUNICATION
- TERRACE



- CORRIDOR
- CITY OFFICE
- MUSEUM TOILET
- MUSEUM
- TECHNICAL ROOM
- VERTICAL COMMUNICATION
- TERRACE

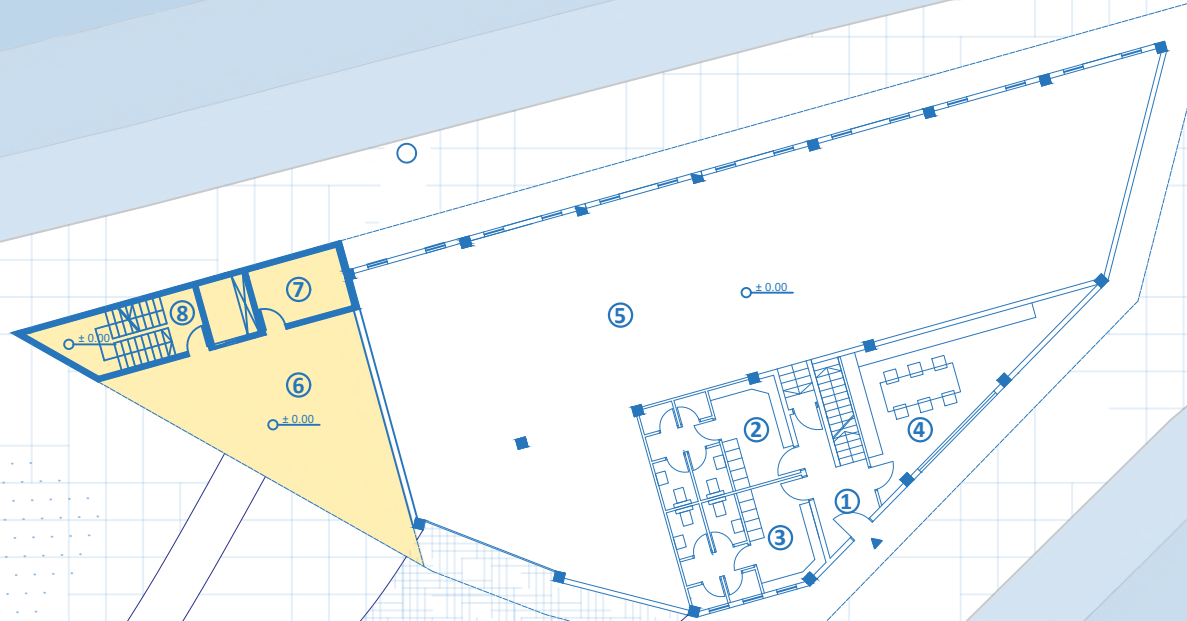


The functional organization of the design solution emerged from direct communication with the users, establishing a clear requirement for expanded training capacities suitable for inter-club collaboration. The program was supplemented with previously lacking facilities: modern changing rooms and multifunctional meeting spaces. The architectural emphasis is placed on the "triangle" zone—an unfinished segment of the building where the existing foundations were utilized as a base for a new vertical communication core. This intervention integrates the staircase, elevators, and necessary technical rooms, thereby optimizing the overall circulation within the building.



GROUND FLOOR R=1:150

- Existing structure
- Extension



- 3.0.1_CORRIDOR
- 3.0.2_MEN LOCKER ROOM
- 3.0.3_WOMEN LOCKER ROOM
- 3.0.4_COMMON ROOM
- 3.0.5_SAILBOAT ACCOMMODATION SPACE
- 3.0.6_TERRACE
- 3.0.7_TECHNICAL ROOM
- 3.0.8_VERTICAL COMMUNICATION

FIRST FLOOR PLAN R=1:150

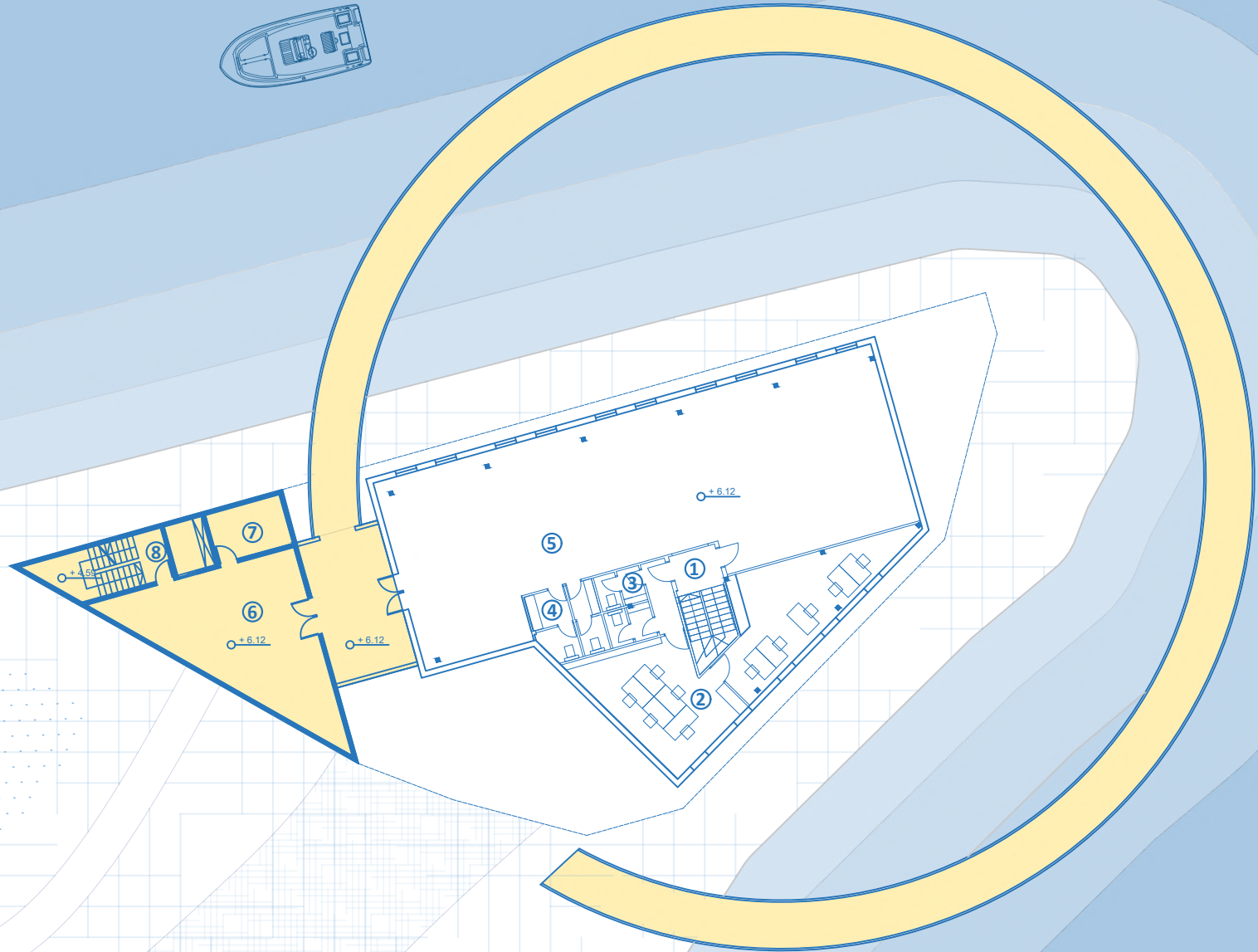
- Existing structure
- Extension



- 3.1.1_CORRIDOR
- 3.1.2_CLUB OFFICE
- 3.1.3_OFFICE TOILET
- 3.1.4_GYM TOILET
- 3.1.5_MULTIFUNCTIONAL HALL
- 3.1.6_TERRACE
- 3.1.7_TECHNICAL ROOM
- 3.1.8_VERTICAL COMMUNICATION

SECOND FLOOR PLAN R=1:150

- Existing structure
- Extension °



- 3.2.1 CORRIDOR
- 3.2.2 CITY OFFICE
- 3.2.3 OFFICE TOILET
- 3.2.4 MUSEUM TOILET
- 3.2.5 MUSEUM
- 3.2.6 TERRACE
- 3.2.7 TECHNICAL ROOM
- 3.2.8 VERTICAL COMMUNICATION

ENVELOPE INTERVENTION

Perforated Envelope and Circulation Ramp

The existing building of the Academic Sailing Club, although relatively recent, remains spatially and architecturally unfinished, with a fragmented program and modest construction quality. Rather than treating it through conventional renovation, the project proposes a layered intervention that redefines its identity and use.

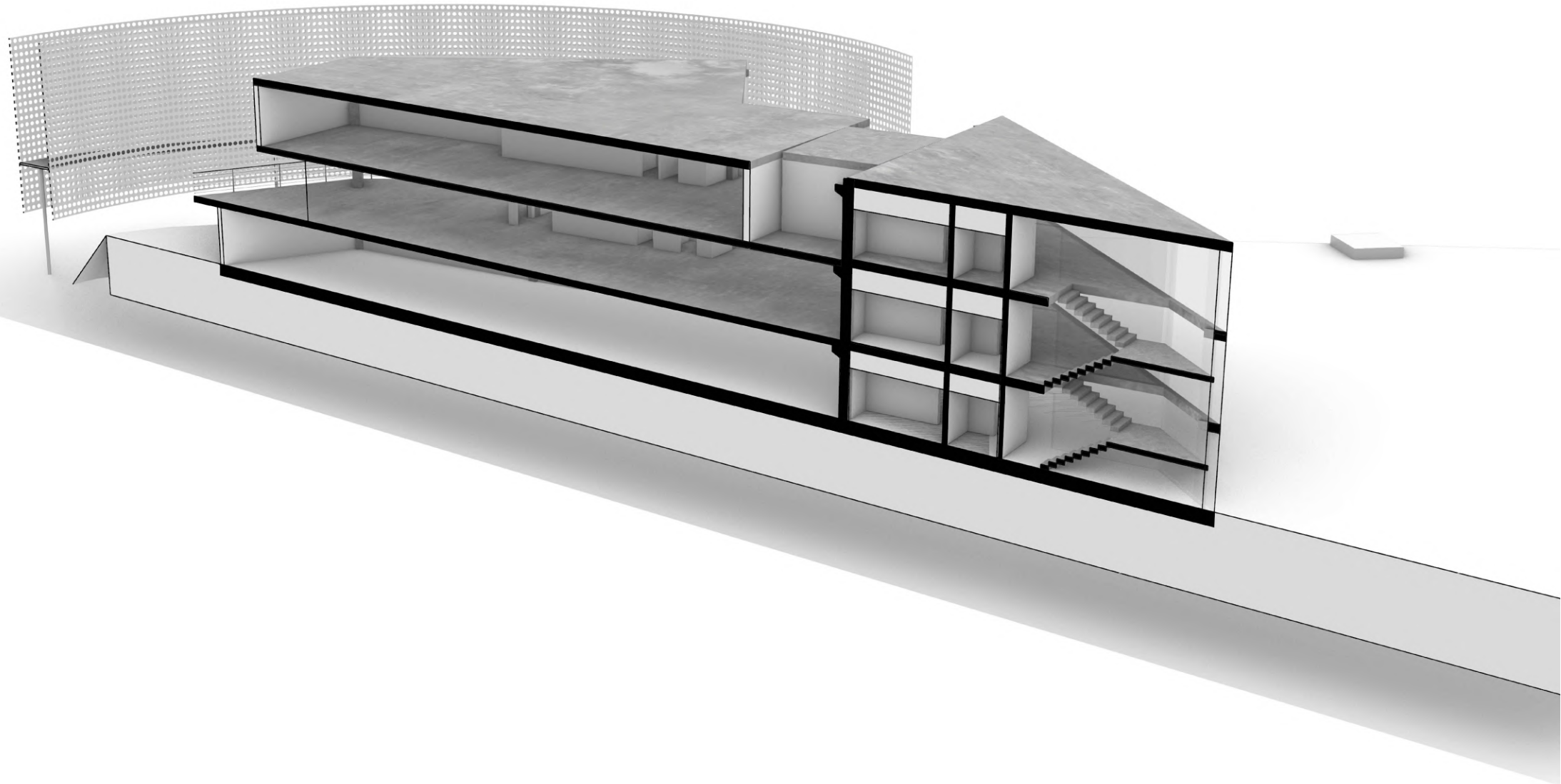
A new perforated envelope is introduced around the existing structure, acting as a unifying architectural element that both conceals and reinterprets the original building. This secondary skin improves the visual coherence of the object while simultaneously contributing to shading, microclimate control, and overall environmental performance.

Within this envelope, a continuous ramp is integrated as a key spatial device. Following the geometry of the facade, the ramp gradually ascends from the ground level to the top floor, transforming the building into an accessible, public promenade. This intervention enhances circulation, connects different programmatic zones, and introduces a new layer of movement and experience.

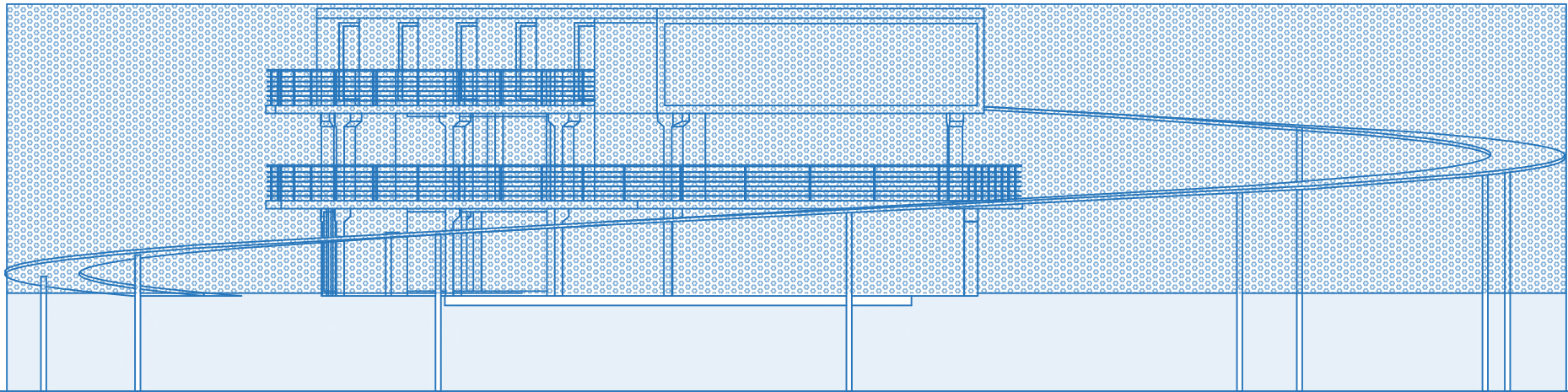
The final point of this sequence is the upper level, where a museum space is positioned, opening the building towards a broader public beyond its primary sporting function. In this way, the intervention not only upgrades the functional capacity of the club, but also repositions it as an inclusive and recognizable landmark along the riverfront.



SECTION A-A



EAST ELEVATION

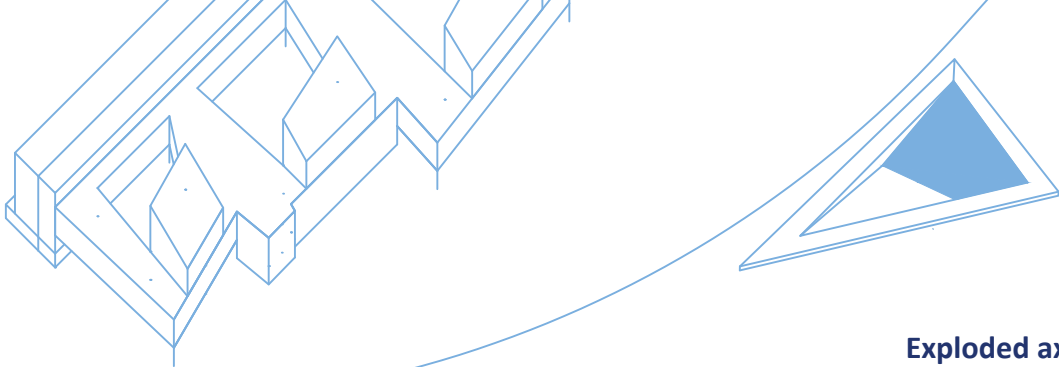




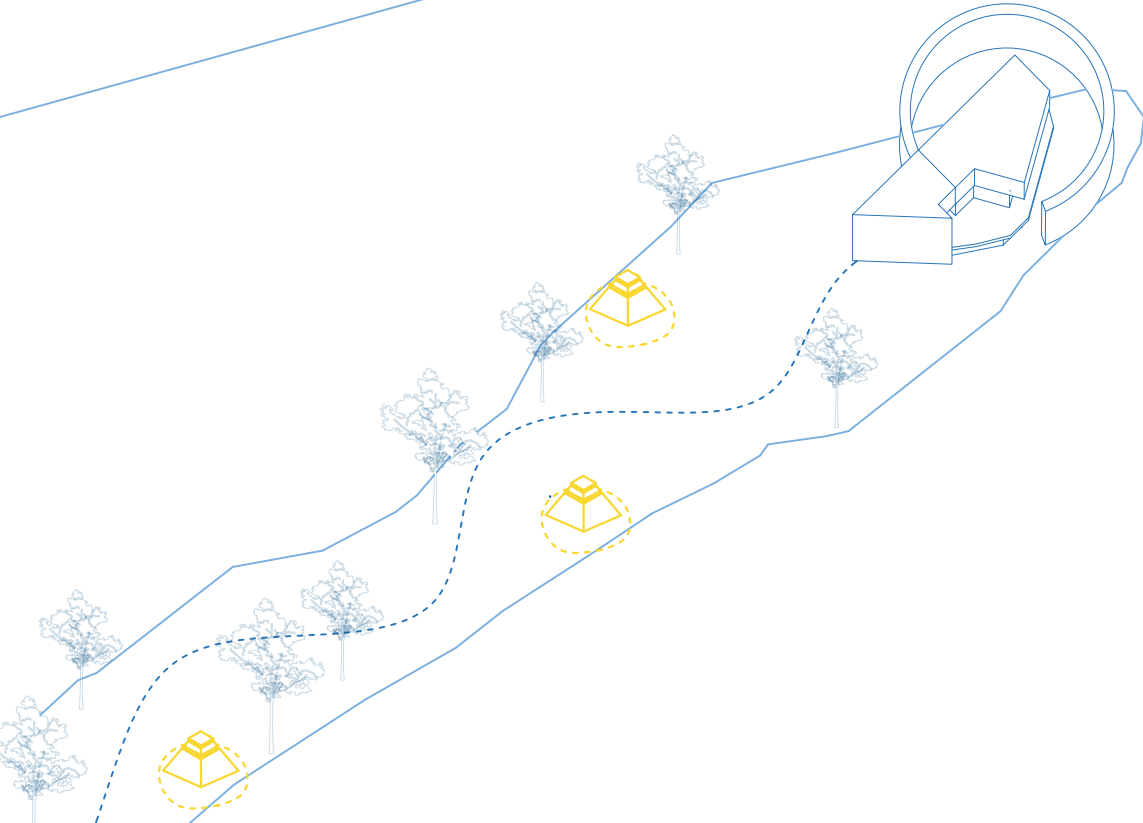
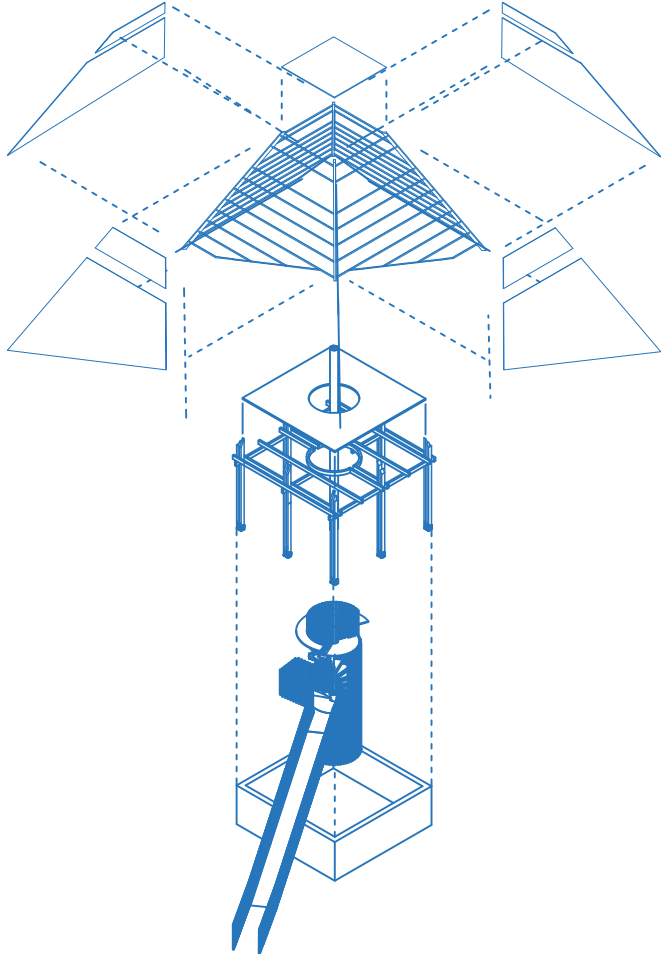
BIRD PROTECTION STRATEGY

Designing observatories for birds

The riverbank area is also important as a habitat for the protected bird species Pygmy cormorant (mali vranac), which winters in this zone. In order to preserve its habitat, special attention was given to minimizing disturbance along the coastline by introducing a protective green buffer. Additionally, a series of small observation points are positioned at strategic locations along the path towards the Academic Sailing Club, allowing controlled interaction with the landscape while respecting the presence of this sensitive species. Pygmy Habitat Protection



Exploded axonometry



ISTORIJA KLUBA

Doklerij bednja huj idenitj, človek je eden od prvih, ki se je lotil plovila. Društvo je menjavalo različne vrste plovil, od preprostih lesenih čolnov do sodobnih, ki so zdaj sestavljena iz kompozitnih materialov. Sčasoma se je razvijala tehnologija, ki je omogočila izdelavo hitrejših in bolj stabilnih plovil. Danes je plovilo, ki ga uporabljamo, rezultat številnih let raziskav in inovacij. Če želite vedeti več o naši zgodovini, si oglejte našo akademsko izdajo o zgodovini kluba.

HULL DESIGN



The hull design is one of the most important parts of a boat. It determines the boat's stability, speed, and maneuverability. The hull is made of various materials, including wood, fiberglass, and carbon fiber. The design of the hull is also influenced by the intended use of the boat, such as racing or cruising.

HULL CONSTRUCTION DESIGN

The hull construction design is a complex process that involves many factors, including the materials used, the shape of the hull, and the way the hull is joined together. The design must take into account the weight of the boat, the strength of the materials, and the way the boat will be used.

TEHNOLOŠKI NAPREDAK U JEDRENIJU

Uspesna jedrenja su rezultat stalnog istraživanja i razvoja. Tehnologija materijala i konstrukcije omogućila je izradu bržih i stabilnijih brodova. Danas se koriste kompozitni materijali i sofisticirane tehnike izrade, što omogućuje izradu brodova koji su ne samo brži već i otporniji na oštećenja.

USPESI NA UNIVERZITETIMA

Naša ekipa je u prošlosti osvojila brojne nagrade na međunarodnim takmičenjima. Ovi uspjesi su dokaz naše stručnosti i predanosti. Danas nastavljamo raditi na tome da budemo među najboljim ekipama na svijetu.

SODIJI KLUBA

Naša ekipa je sastavljena od najboljih članova kluba. Svi članovi su ljubitelji jedrenja i imaju bogato iskustvo. Danas nastavljamo raditi na tome da privučemo još više članova i da im omogućimo najbolje uvjete za učenje i razvoj.

TROPHY WALL



TEHNOLOGIJA

Naša ekipa koristi najnoviju tehnologiju u jedrenju. Ova tehnologija omogućuje izradu brodova koji su brži, stabilniji i otporniji na oštećenja. Danas nastavljamo raditi na tome da budemo među najboljim ekipama na svijetu.

