



ARCHITECTURE STUDENT CONTEST

21st INTERNATIONAL EDITION, BELGRADE 2026



Toms Herings

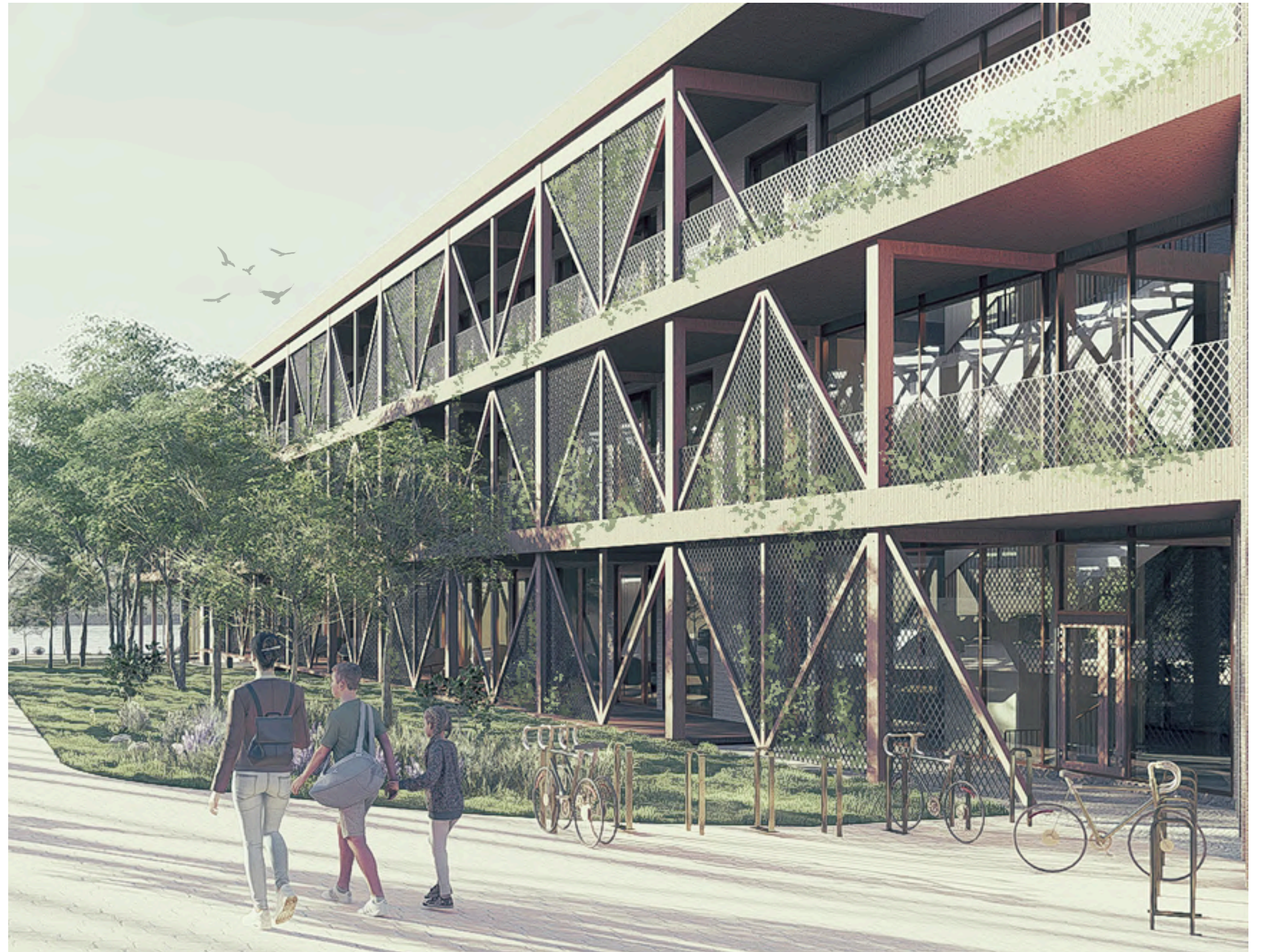


Kitija Lejniece

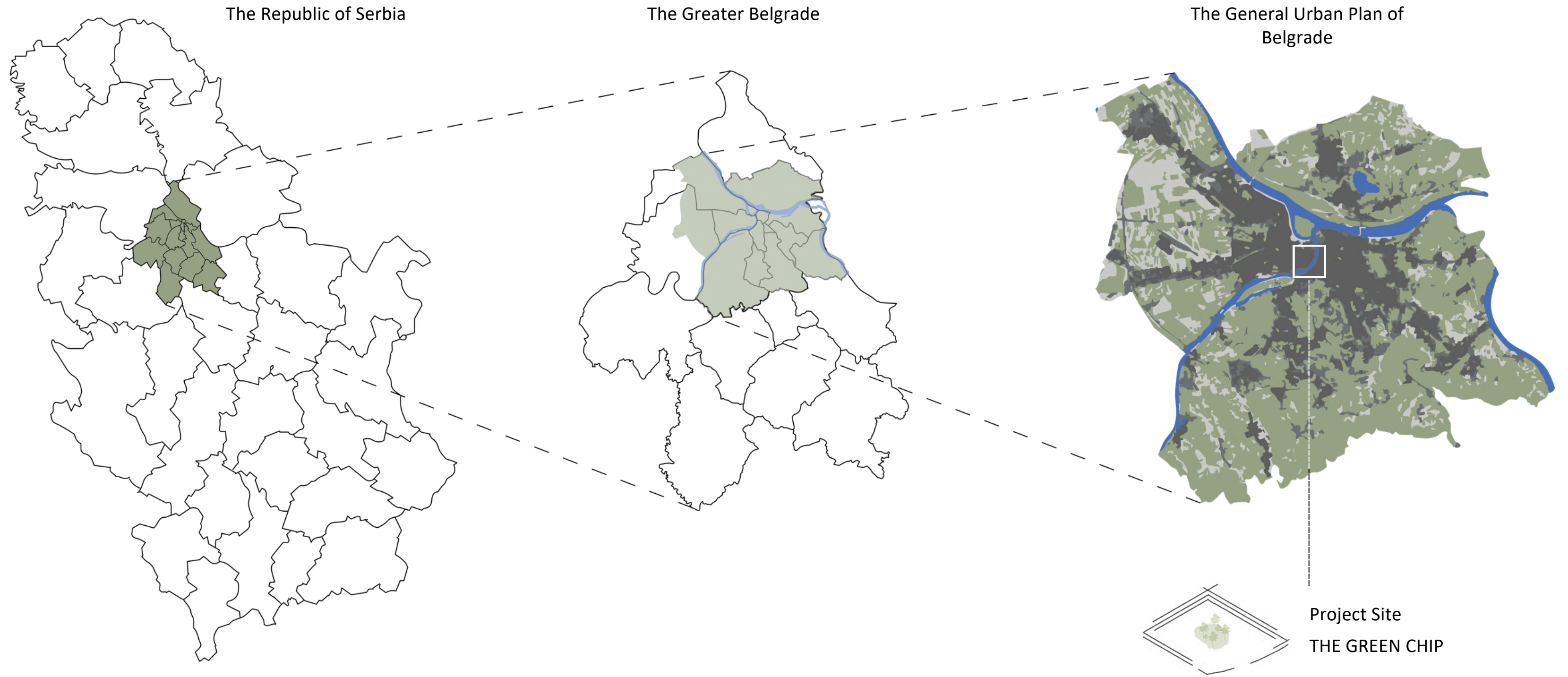


THE GREEN CHIP

Team no. 5, Latvia

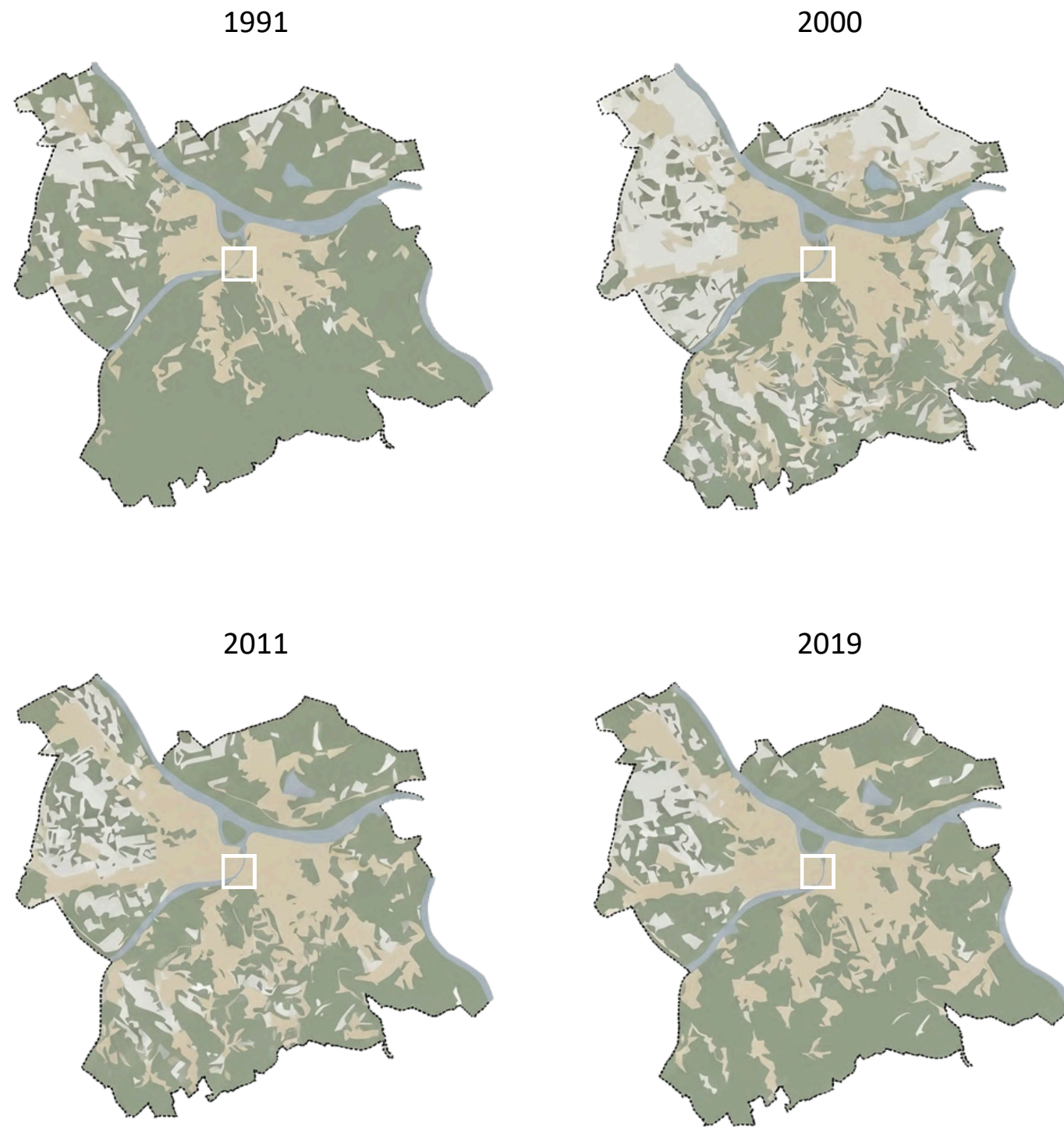


PROJECT LOCATION



ANALYSIS

Land cover of Belgrade from 1991-2019





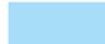




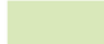




ANALYSIS



ANALYSIS



- | | | |
|--|--|---|
|  INDUSTRIAL ZONE |  BUILDINGS (URBAN FABRIC) |  MAIN ROADS |
|  RESIDENTIAL AREA |  PARKING |  SECONDARY ROADS |
|  RETAIL/ COMMERCIAL |  BIKE ROUTES |  500 M RADIUS |
|  GREEN AREAS |  PEDESTRIAN ROUTES |  PROPOSED BUILDING |

ANALYSIS

The Green Belt in New Belgrade - street views



Existing site conditions



CONCEPT



Belgrade's building blocks
(CHIPS)



Contest area as anew
GREEN CHIP
of Belgrade



Old railway bridge renovation



The **NEW BLOODLINE** to
New Belgrade and
to our plot



Reacting to the **RIVERSIDE**

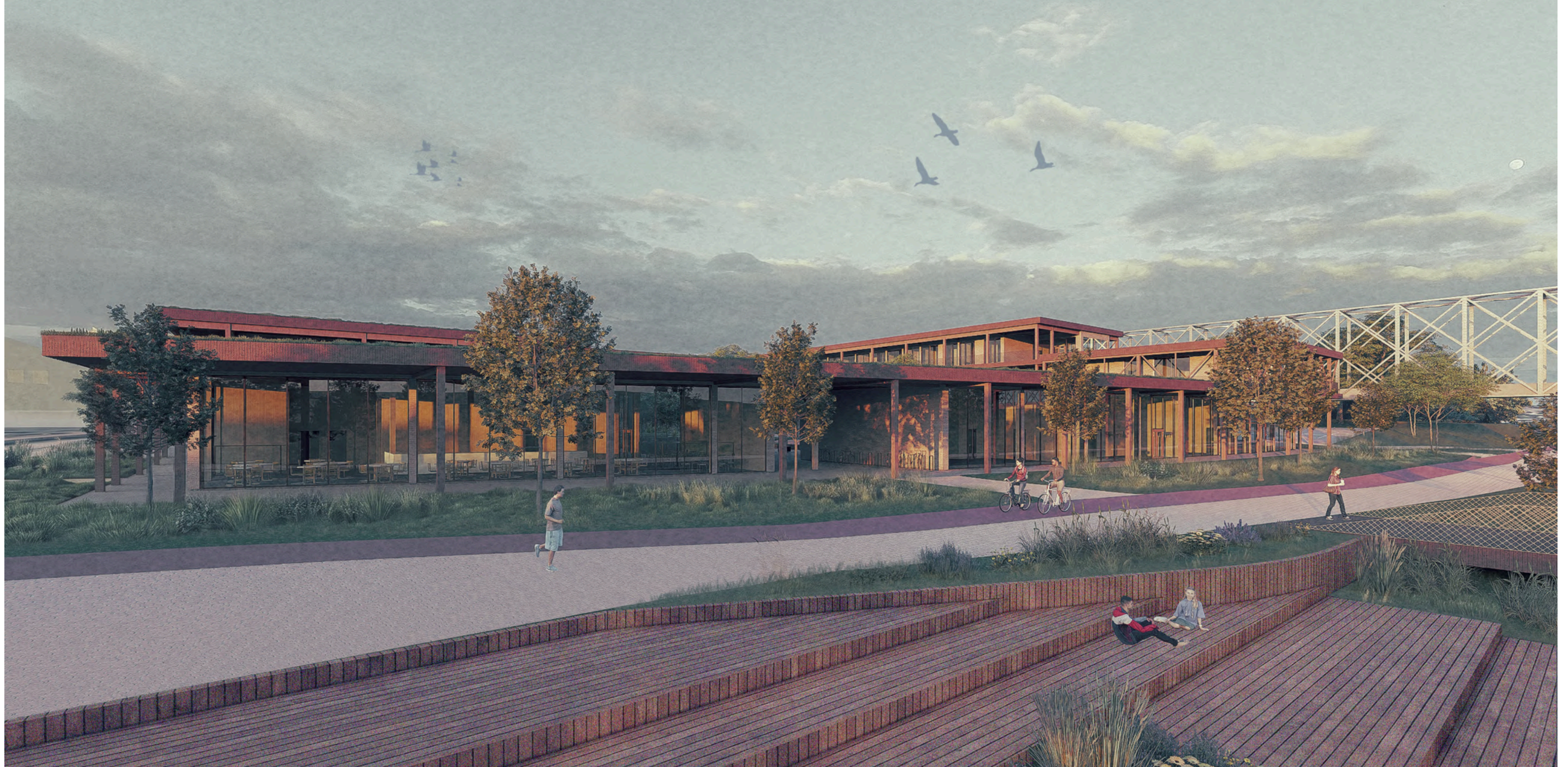


Reimagining the brutalist mega-
structures of Belgrade

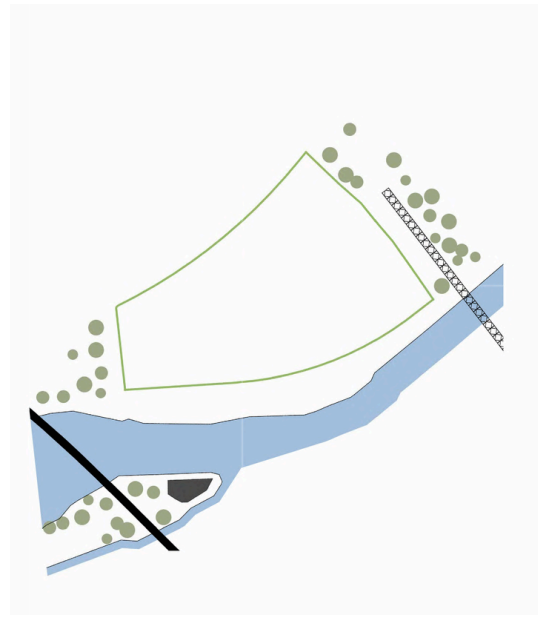


DOWNSCALED and **OPEN**
building, inspired by the idea
AN ANCIENT GYMNASIUM

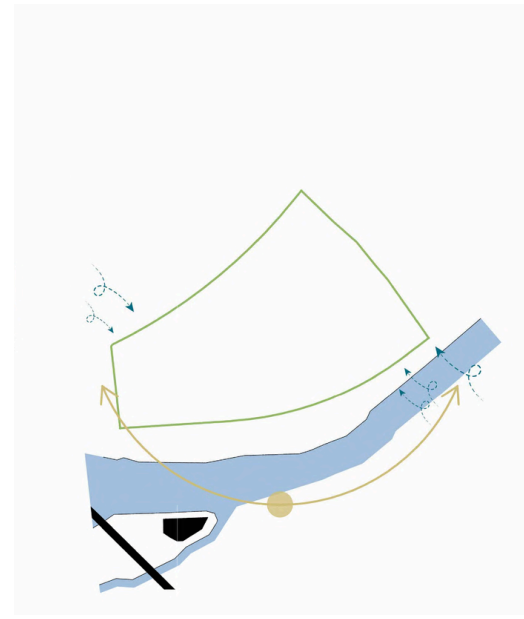
NEW CONSTRUCTION. ZONE A



FORM DEVELOPMENT



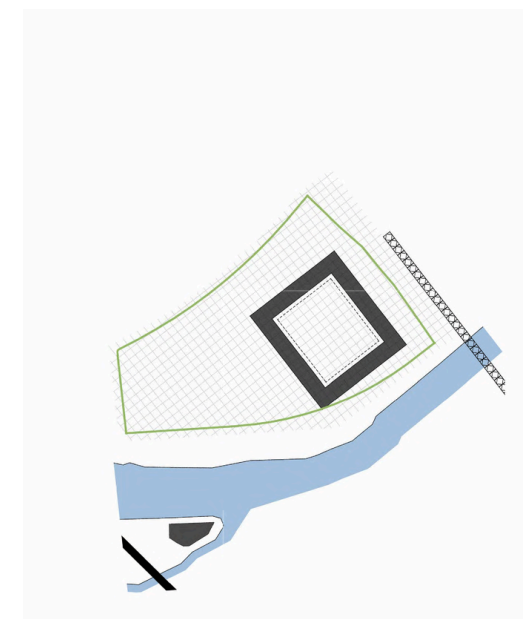
Planned future greenery around the site



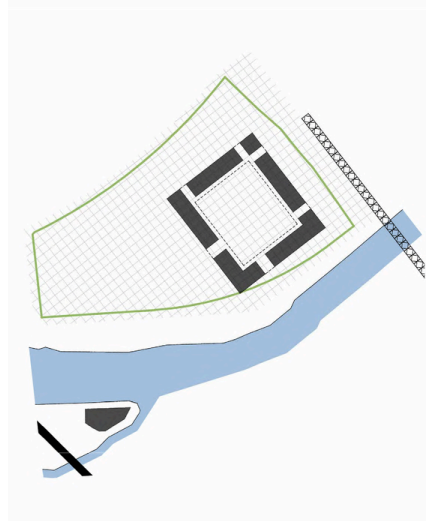
Direction of sunlight and main winds



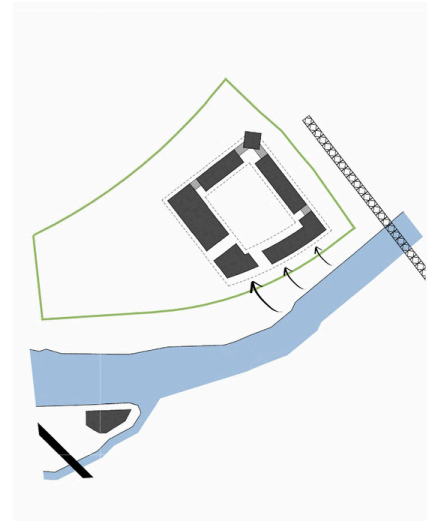
Consideration of the position, orientation and gridline of the building and the site



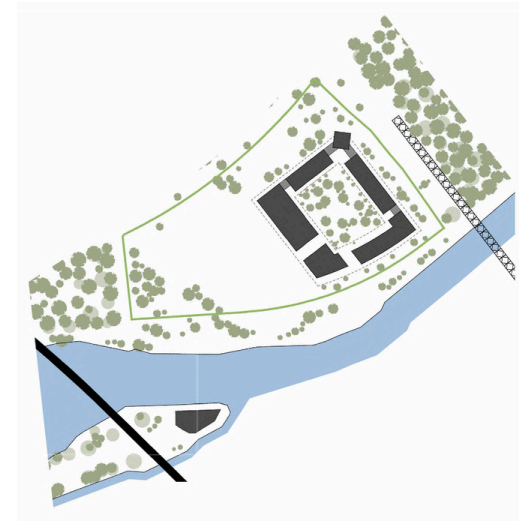
Volumetric base stage of the building



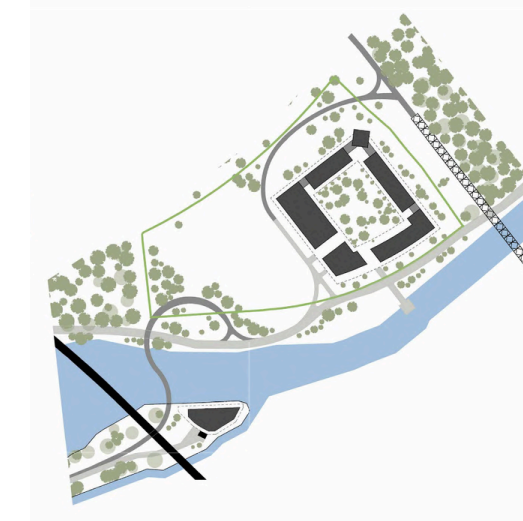
Consideration of the functions and openings



Adjusting the riverside volumes and closing up the openings for the accommodation volumes



Introducing the greenery into the site and into the courtyard



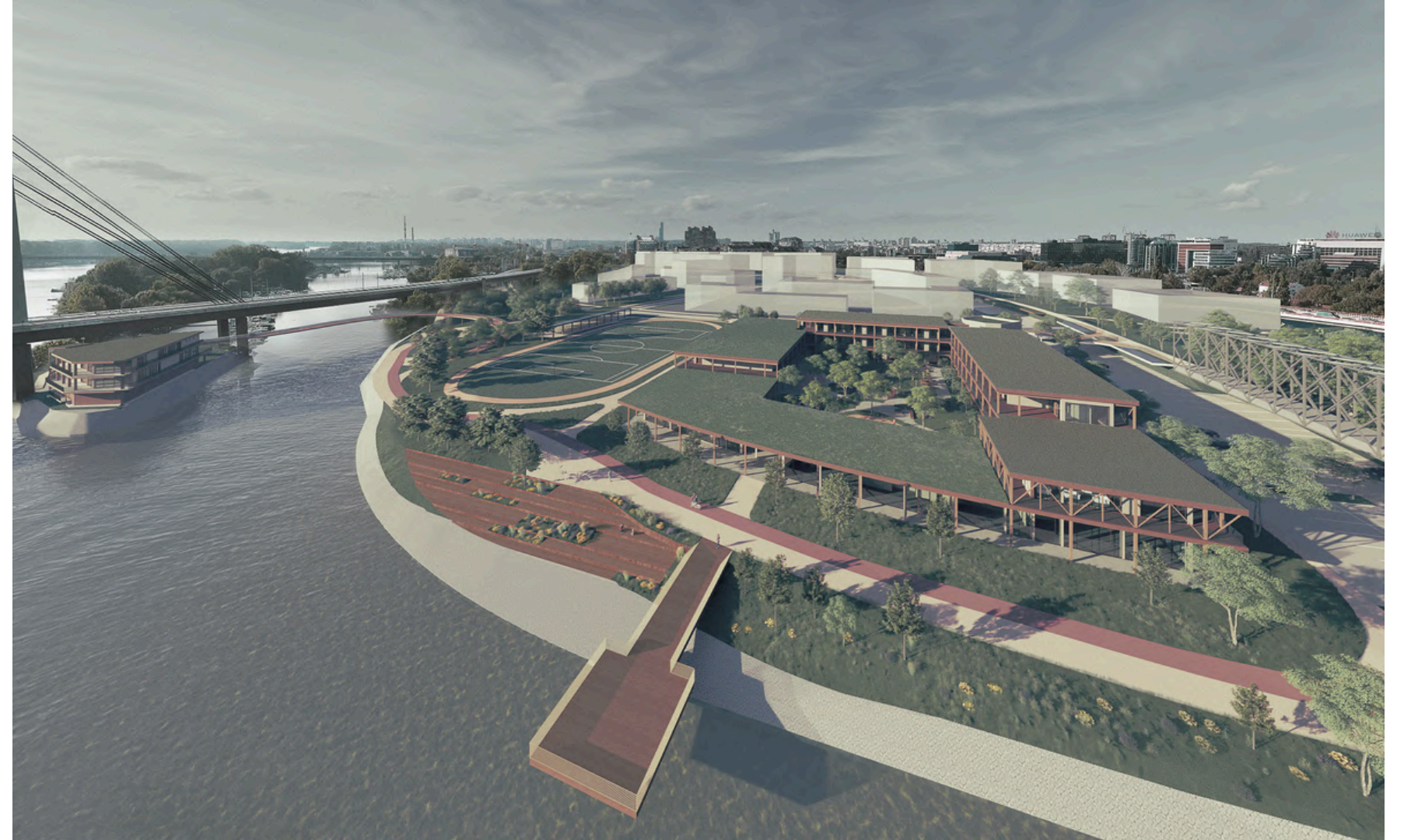
Introducing the paths and bridge connections

THE VISION

From a degraded natural environment



Towards a biodiverse riverside environment





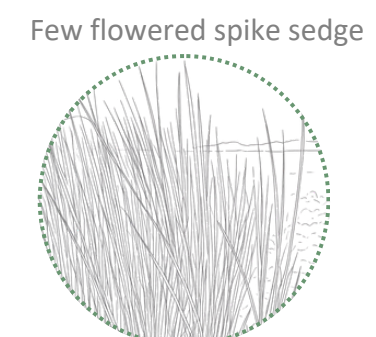
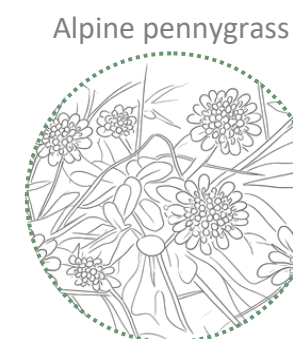
A ROAD TO BIODIVERSE GREEN ZONES

PHASE 1 - ASSESSMENT
Soil testing, pH mapping, heavy metal analysis, compaction depth survey

PHASE 2
IF NEEDED

SOIL REMEDIATION
Drawing contaminants out, breaking soil compaction, lowering pH with sulfur + compost

or **SOIL REPLACEMENT**
Allows skipping the phase 3.
Could be used in the areas closest to the promenade and public access zones

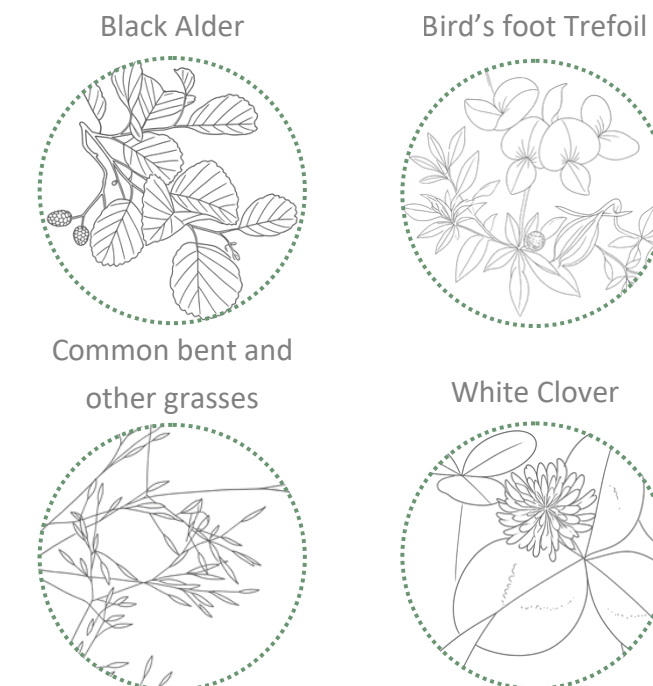


rapid visual results

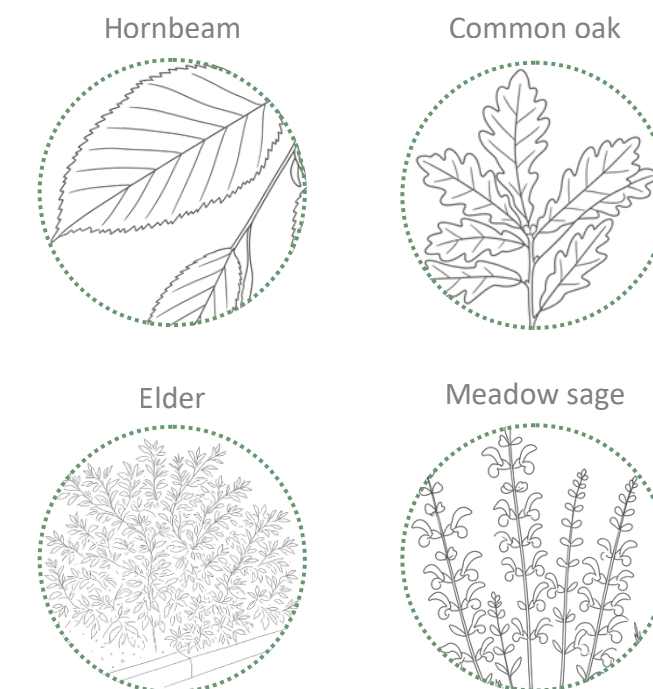


A ROAD TO BIODIVERSE GREEN ZONES

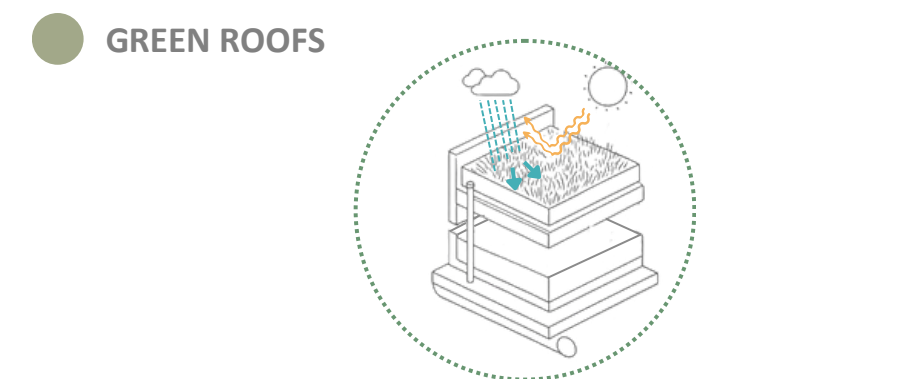
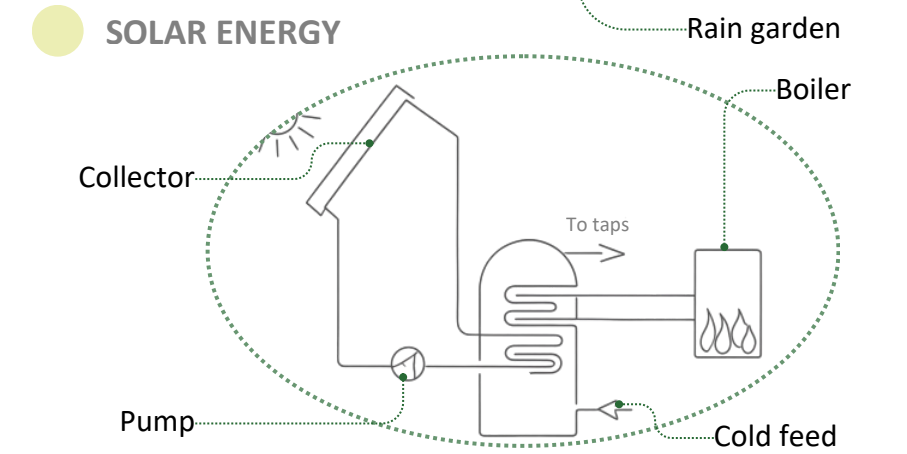
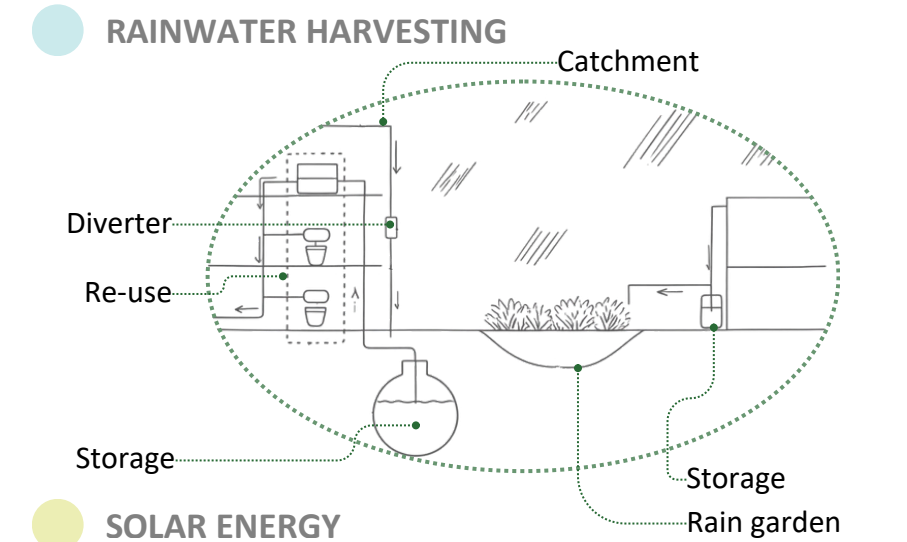
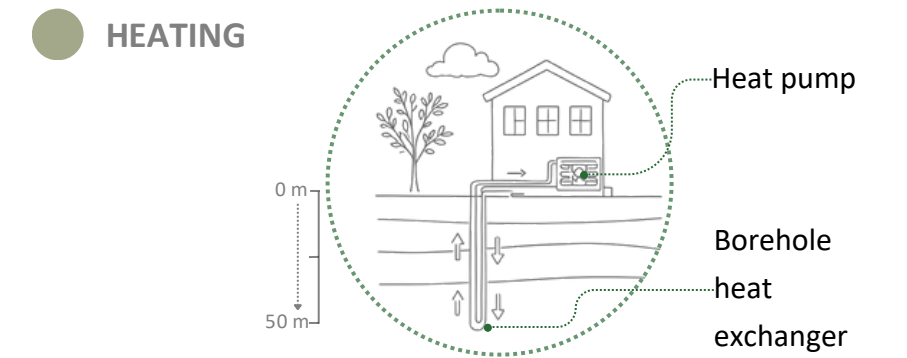
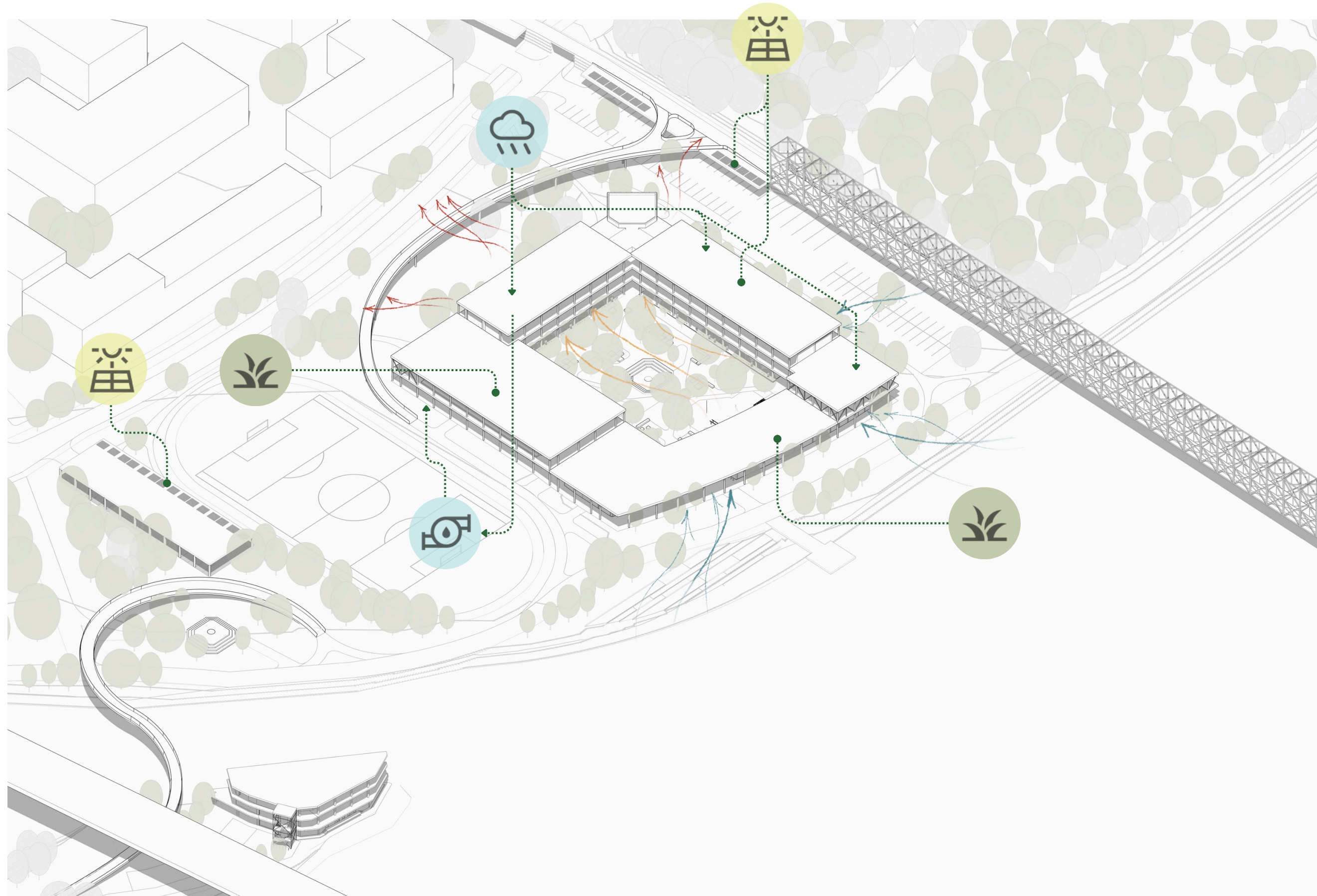
PHASE 3 - PIONEER PLANTING
 Building organic matter, fixing nitrogen, restoring soil microbiology, stabilising the ground



PHASE 4 - NATIVE COMMUNITY PLANTING
 Recreate a Danube/Sava floodplain ecosystem: canopy, shrubs, meadow, and wet-edge zones



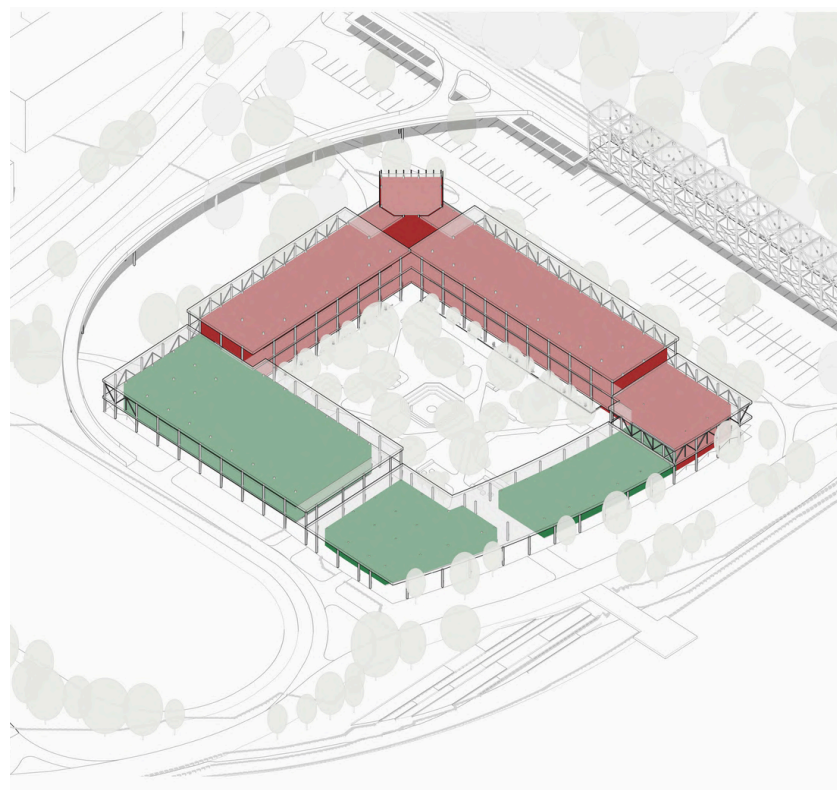
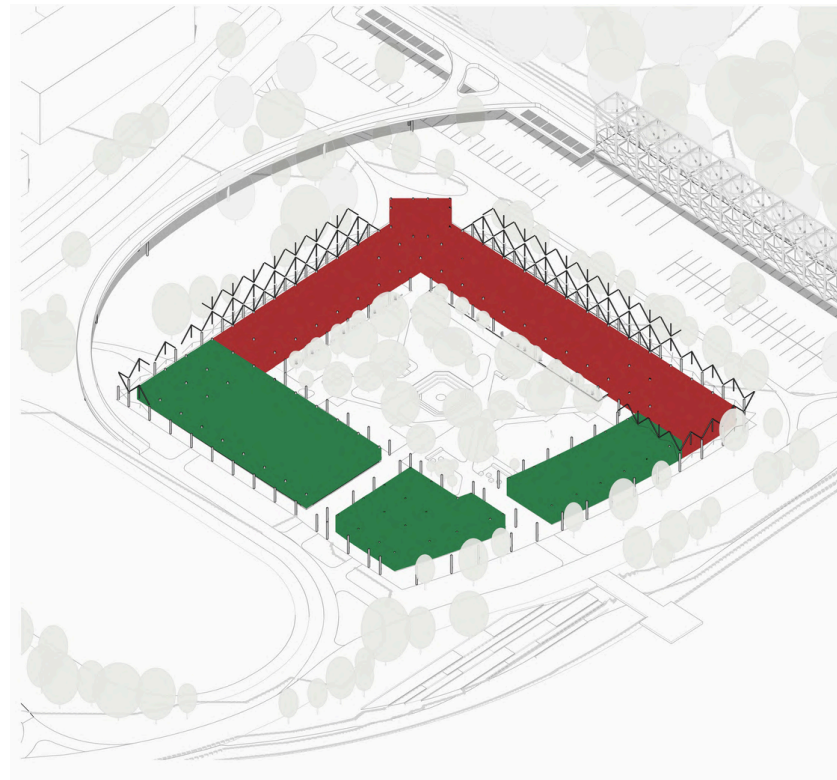
SUSTAINABILITY STRATEGY





FUNCTIONAL ZONING

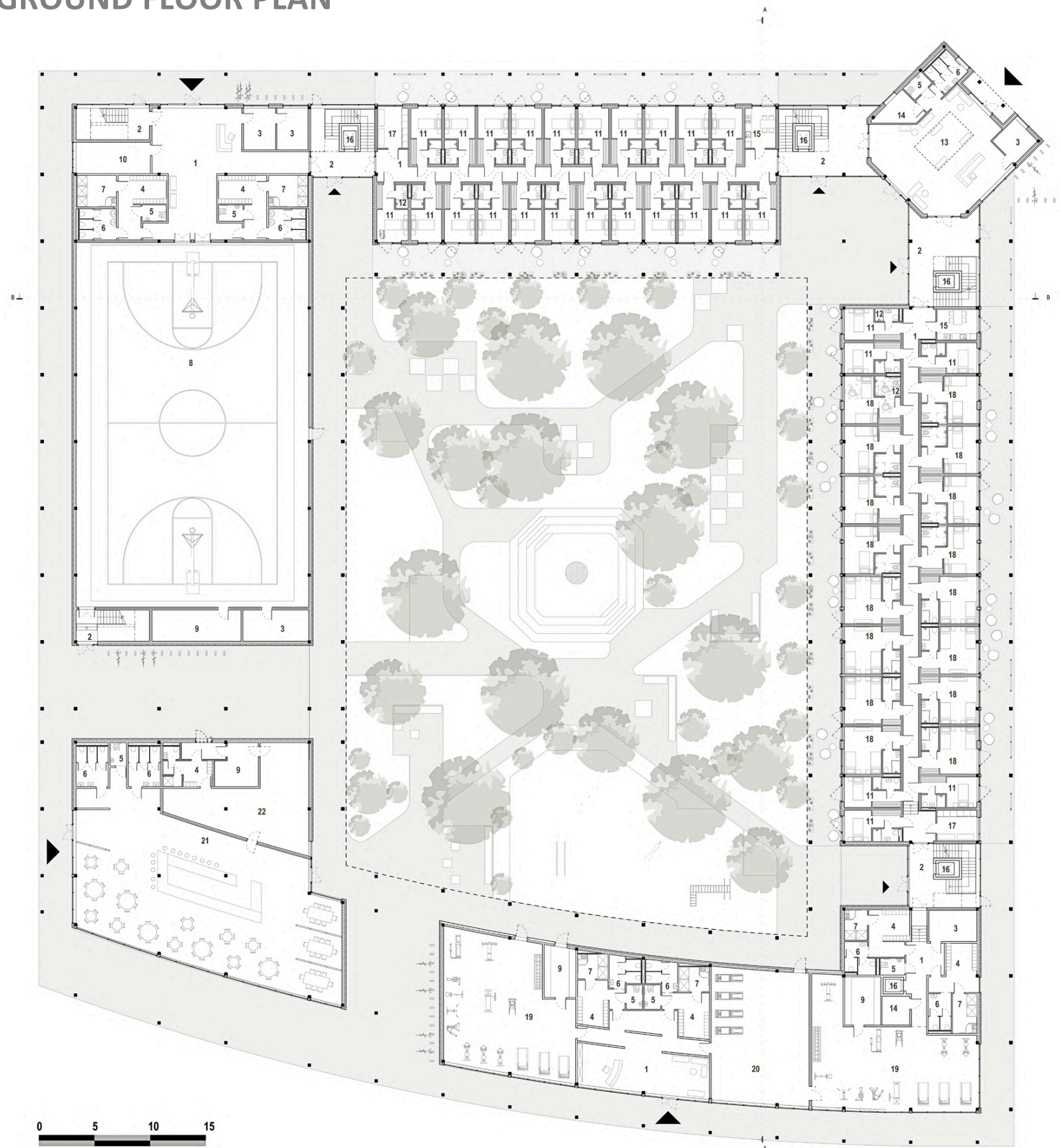
INNER COURTYARD



● Public zone. Area for public functions
sports hall, gym and cafe

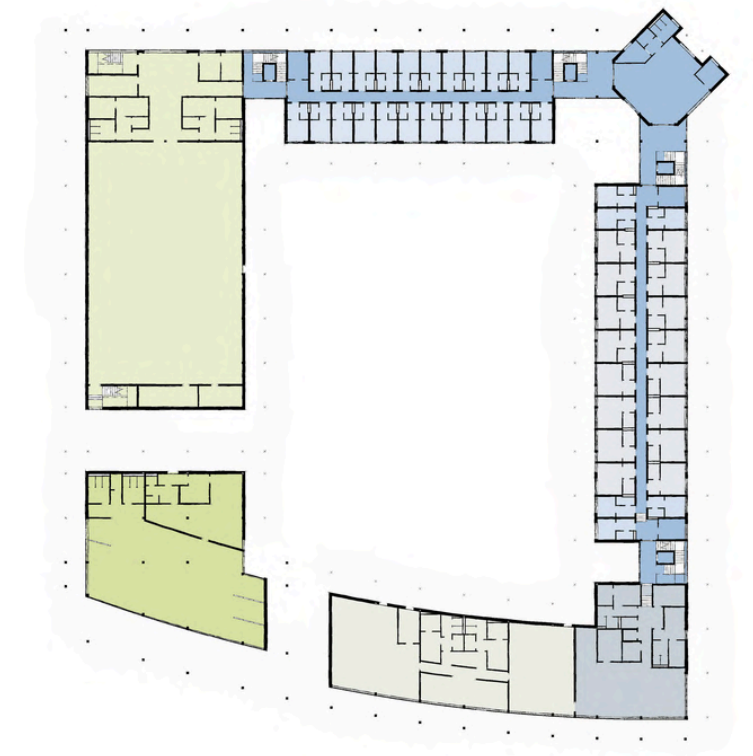
● Private zone. Area for athletes

GROUND FLOOR PLAN

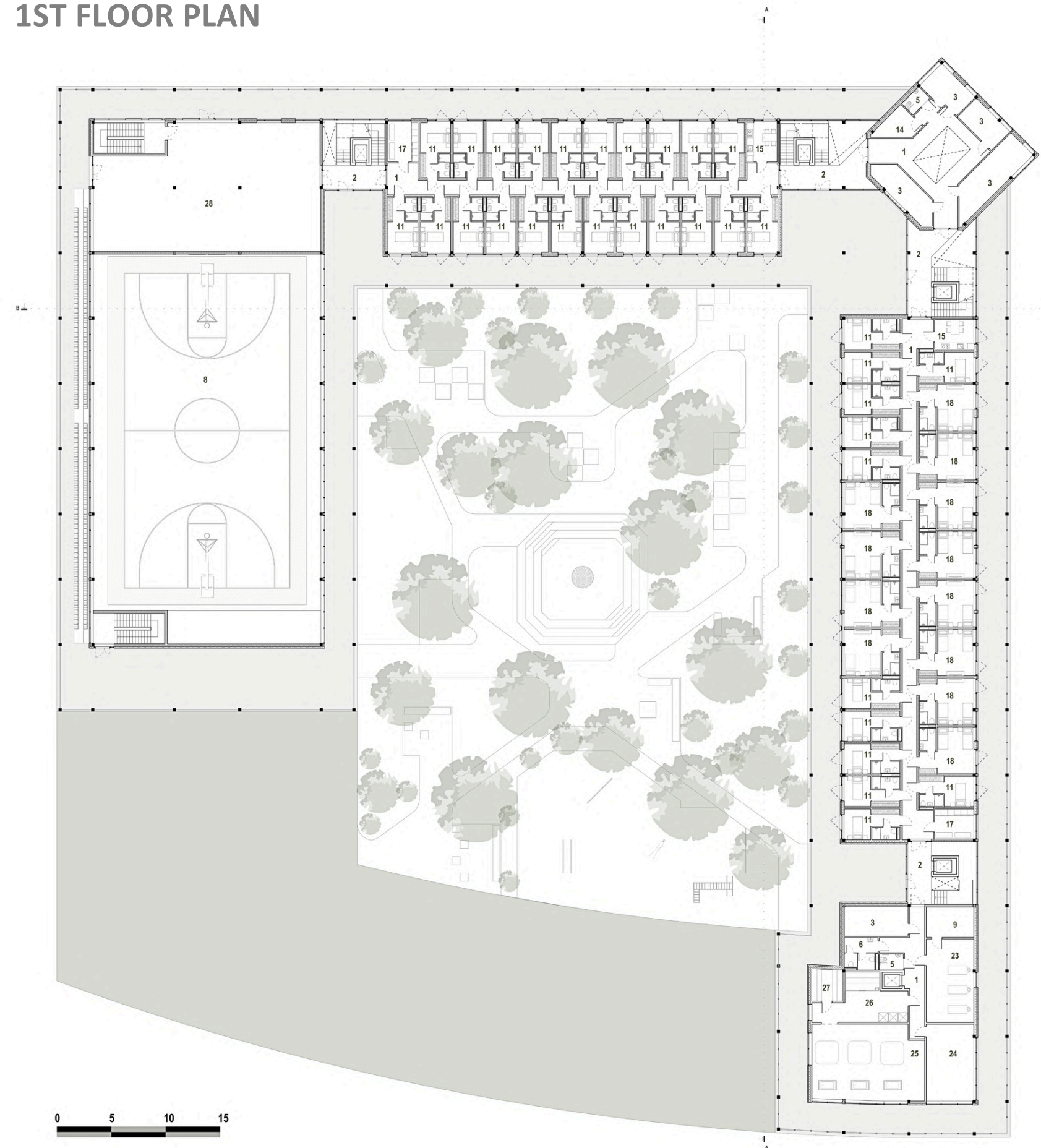


- 1. COMMON AREA
- 2. STAIRCASE
- 3. STAFF ROOM
- 4. DRESSING ROOM
- 5. ACCESSIBLE WC
- 6. COMMON WC
- 7. SHOWER ROOM
- 8. MULTI-PURPOSE SPORTS HALL
- 9. STORAGE
- 10. MEDICAL ROOM
- 11. SINGLE ROOM
- 12. BATHROOM
- 13. MAIN LOBBY
- 14. JANITORS ROOM
- 15. COMMON KITCHEN
- 16. ELEVATOR
- 17. LAUNDRY ROOM
- 18. DOUBLE ROOM
- 19. GYM
- 20. MULTI-PURPOSE TRAINING ROOM
- 21. DINING HALL / CAFE
- 22. KITCHEN FOR CAFE

- SPORTS FACILITIES
- DINING HALL / CAFE
- OPEN GYM
- GYM FOR THE ATHLETES
- SINGLE ROOMS
- DOUBLE ROOMS
- ACCOMODATION COMMON SPACES

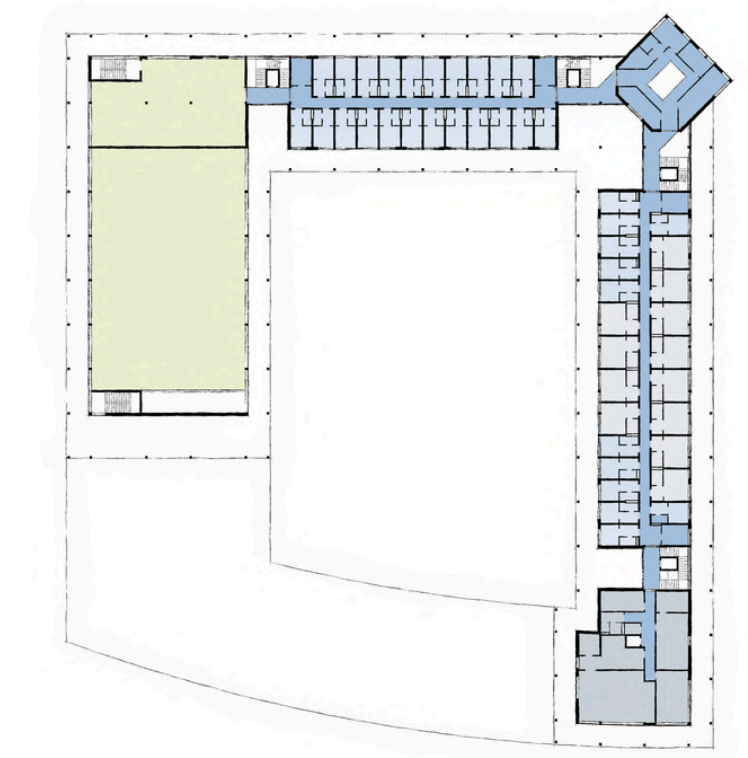


1ST FLOOR PLAN

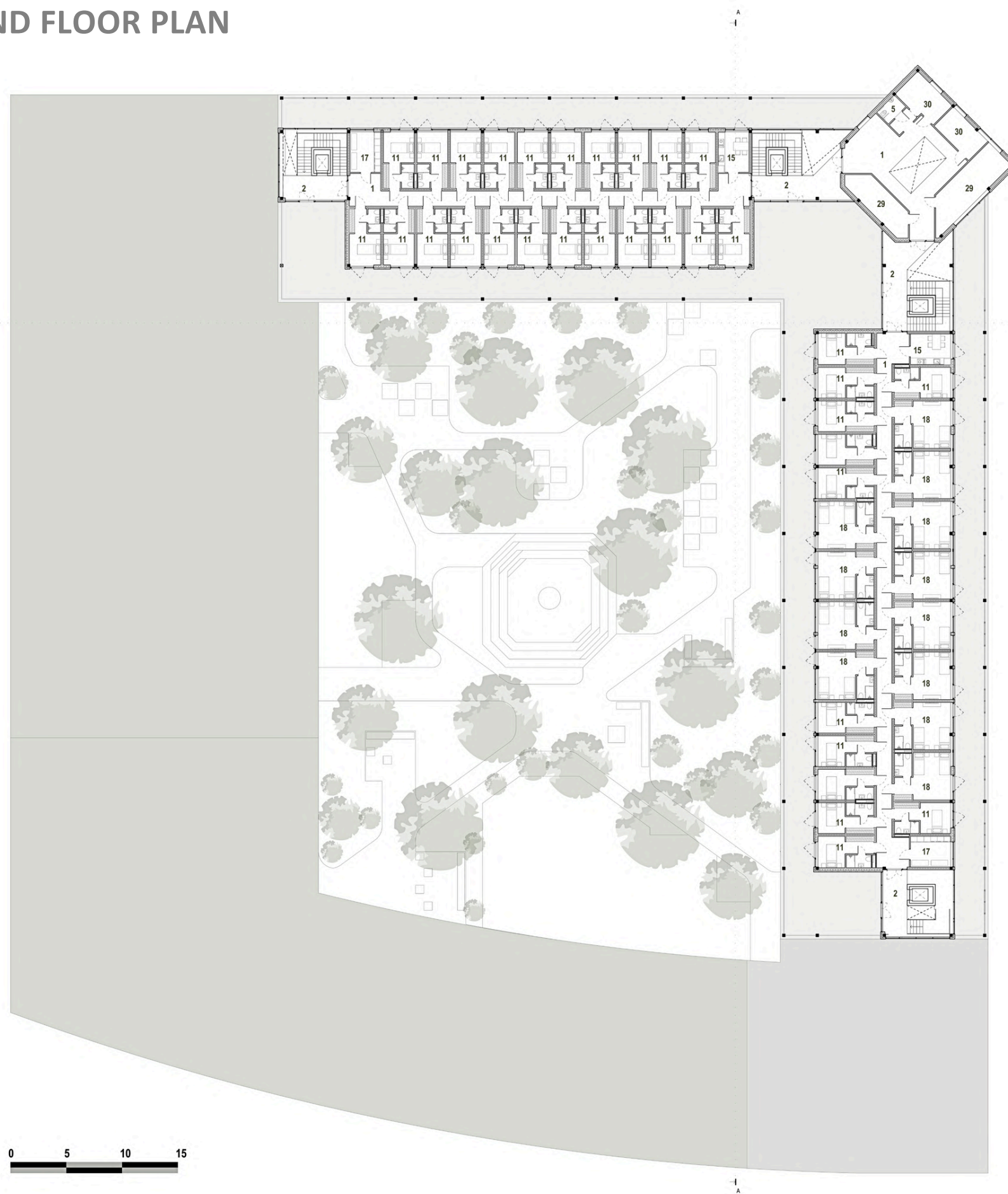


- 1. COMMON AREA
- 2. STAIRCASE
- 3. STAFF ROOM
- 5. ACCESSIBLE WC
- 6. COMMON WC
- 8. MULTI-PURPOSE SPORTS HALL
- 9. STORAGE
- 11. SINGLE ROOM
- 12. BATHROOM
- 14. JANITORS ROOM
- 15. COMMON KITCHEN
- 17. LAUNDRY ROOM
- 18. DOUBLE ROOM
- 23. MASSAGE ROOM
- 24. PHYSIOTHERAPY ROOM
- 25. RECOVERY ROOM
- 26. SAUNA
- 27. STEAM ROOM
- 28. MULTI-PURPOSE RECREATIONAL ROOM

- SPORTS FACILITIES
- GYM FOR THE ATHLETES
- SINGLE ROOMS
- DOUBLE ROOMS
- ACCOMODATION COMMON SPACES



2ND FLOOR PLAN

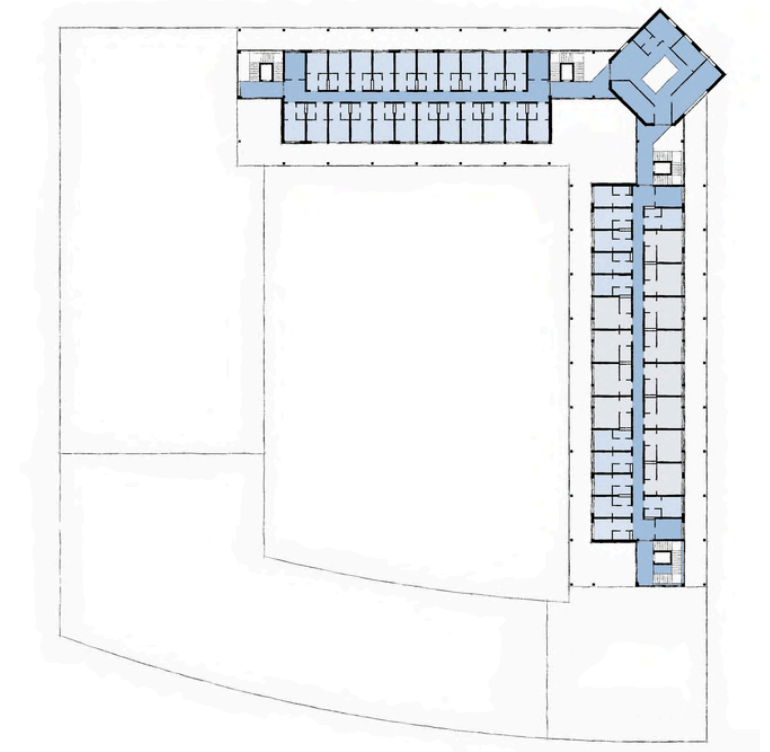


- 1. COMMON AREA
- 2. STAIRCASE
- 5. ACCESSIBLE WC
- 11. SINGLE ROOM
- 12. BATHROOM
- 15. COMMON KITCHEN
- 17. LAUNDRY ROOM
- 18. DOUBLE ROOM
- 29. GAMES ROOM
- 30. QUIET STUDY ROOM

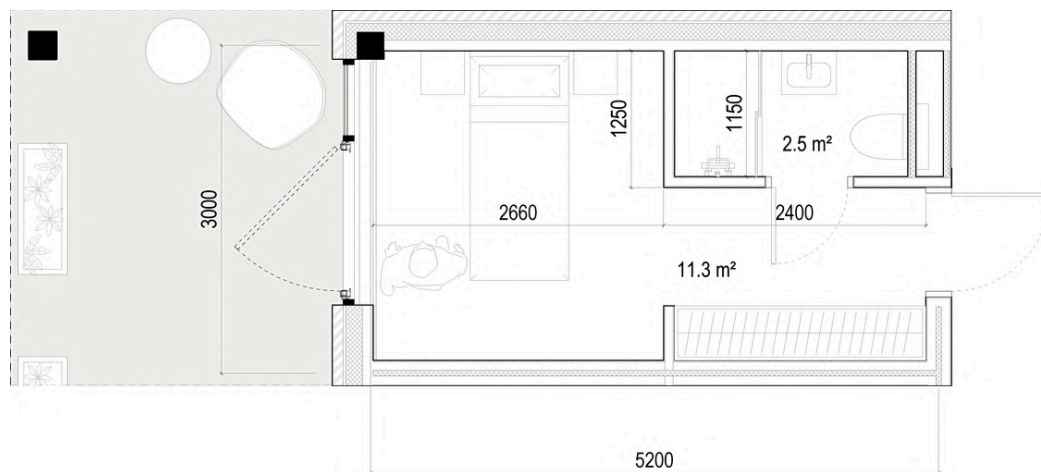
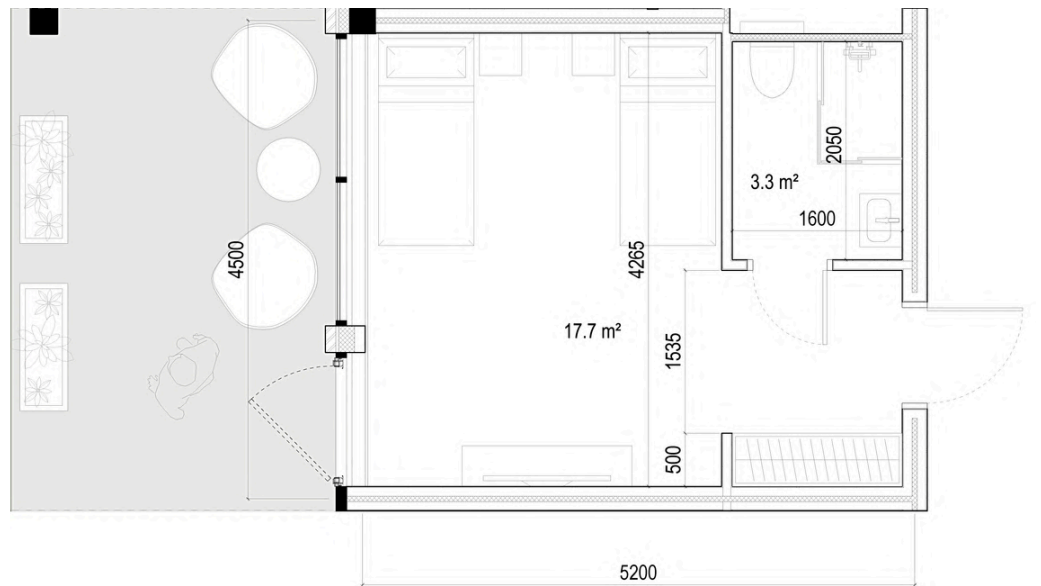
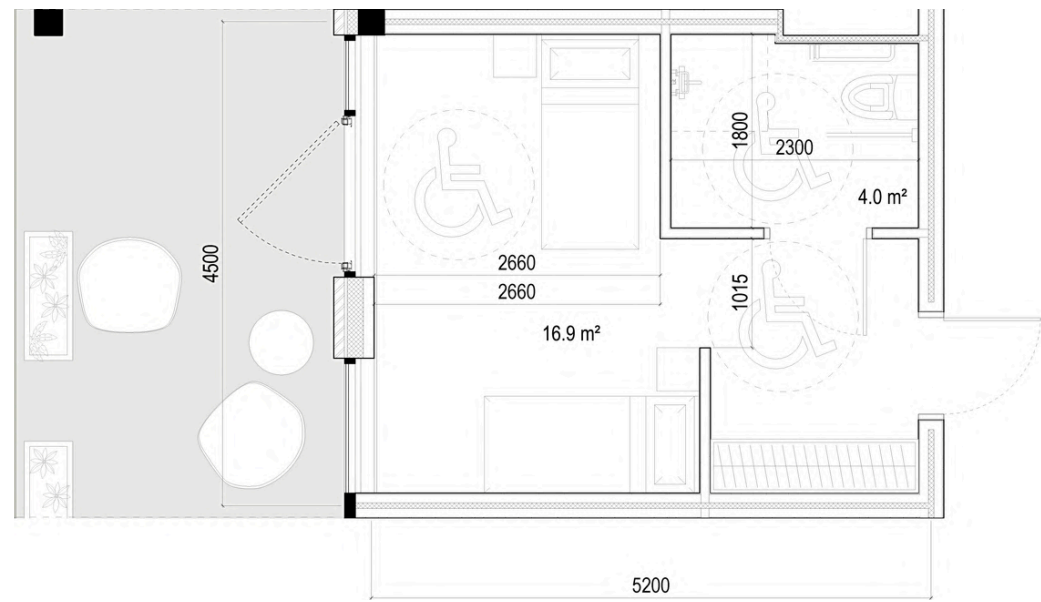
- SINGLE ROOMS
- DOUBLE ROOMS
- ACCOMODATION COMMON SPACES

TOTAL EXPLICATION

| | |
|----------------------------|-----------------------|
| SPORTS FACILITIES | 1200.5 m ² |
| CAFE | 425.9 m ² |
| OPEN GYM | 381.2 m ² |
| GYM FOR THE ATHLETES | 446.7 m ² |
| SINGLE ROOMS | 1288.9 m ² |
| DOUBLE ROOMS | 834.8 m ² |
| ACCOMODATION COMMON SPACES | 1270.9 m ² |
| TOTAL | 1270.9 m ² |



ROOM TYPES



SECTIONS

SECTION A-A



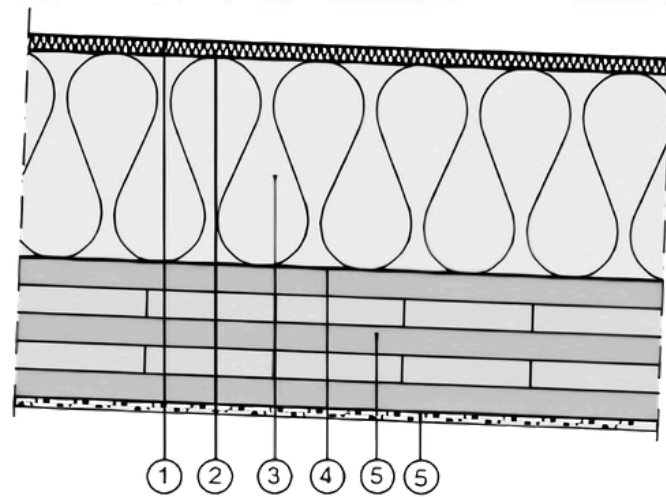
SECTION B-B



MATERIALS AND SPECIFICATIONS

YT3 LOW-PITCHED ROOF

Fire resistance (inside and out) REI CLT180 (5 layers) REI 90 Load 6 kN/m² at a span width of 5 metres

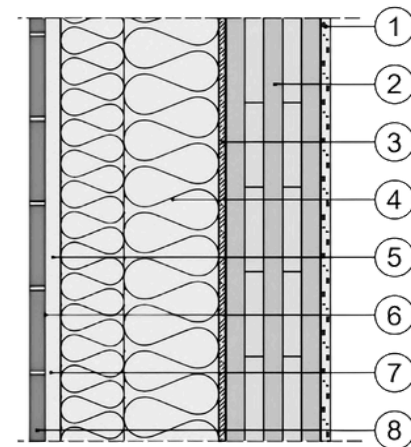


1. 6 mm Waterproofing
2. 20 mm ISOVER ROBUST Ceiling Board
3. 180 mm ISOVER ROBUST Ceiling Panel
4. 2 mm Underlay felt
5. 180 mm CLT element
6. 12.5 mm Gyproc GNE 13 Normal

| Properties and definitions | | | 180/20 |
|----------------------------|----------------------|---------------------------------------|-------------------|
| | U-value | W/m ² K | 0.15 ¹ |
| | Carbon footprint | kg CO ₂ per m ² | 34 |
| | Weight | kg/m ² | 113 |
| | Structural thickness | mm | 401 |

YV5 OUTER WALLS

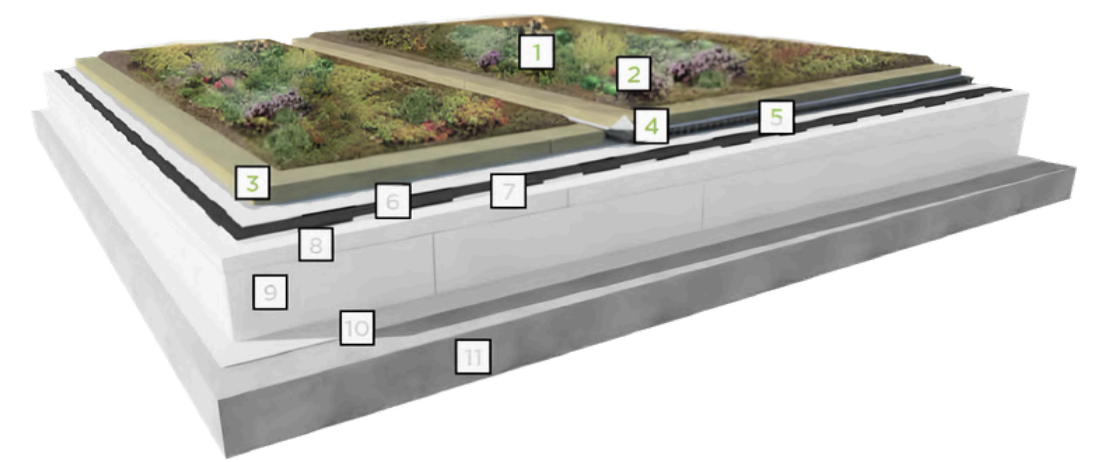
Fire resistance ¹ (inside and out) REI REI 60 (μfi=60%) REI 90 (μfi=40%)



1. 12.5 mm Gyproc GNE 13 Normal
2. 120 mm CLT element
3. 9.5 mm webertherm 500
4. 100+80 mm webertherm 371
5. 20 mm webertherm 344
6. 3 mm weber flex fix
7. – weber coloured masonry mortar M2.5
8. 14 mm weber design bricks

| Properties and definitions | | | Thickness webertherm 371 (mm) | | | |
|----------------------------|-----------------|---------------------------------|---------------------------------------|-------------------|-------------------|-------------------|
| | | | 120 | 150 | 180 | 200 |
| | Sound reduction | R _w | 54 ² | 54 ² | 54 ² | 54 ² |
| | | R _w C | 53 ² | 53 ² | 53 ² | 53 ² |
| | | R _w +C _{tr} | 52 | 52 | 52 | 52 |
| | U-value | W/m ² K | 0.21 ³ | 0.17 ³ | 0.15 ³ | 0.14 ³ |
| | | Carbon footprint | kg CO ₂ per m ² | 35 | 36 | 38 |
| | Weight | kg/m ² | 151 | 153 | 155 | 157 |
| | | Structural thickness | mm | 302 | 332 | 362 |

YTG GREEN ROOF

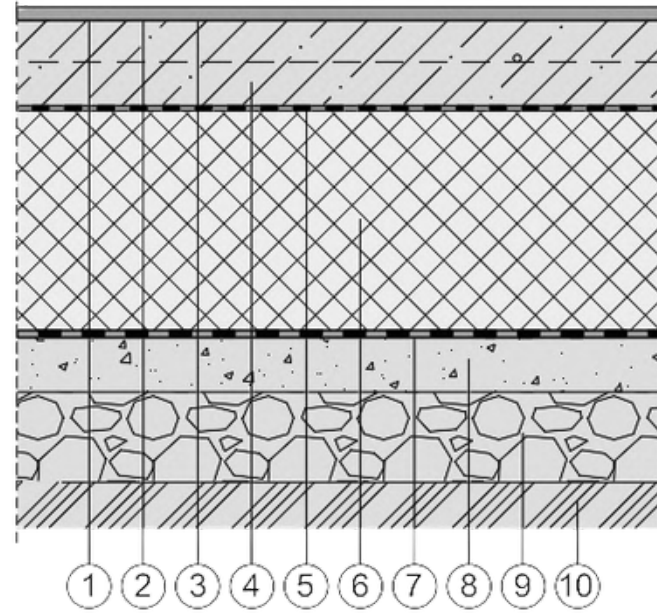


1. Extensive vegetation – sedums, sem- pervivums, succulents
2. Extensive mineral substrate, 30 mm thick
3. Isover Flora hydrophilic panels, thick- ness 50 mm
4. Filter fabric, 120 g/m² (only used with dimpled membrane)
5. Drainage dimpled membrane (use depends on drainage capacity calculation)
U-value 0.10 W/m²K)
6. Protective geotextiles, 300 g/m²
7. Waterproofing resistant to root pene- tration
8. Isover EPS 150 thermal insulation gradient wedges
9. Isover EPS 100 thermal insulation
10. Vapour barrier
11. Supporting roof structure - CLT

MATERIALS AND SPECIFICATIONS

GG-1.1

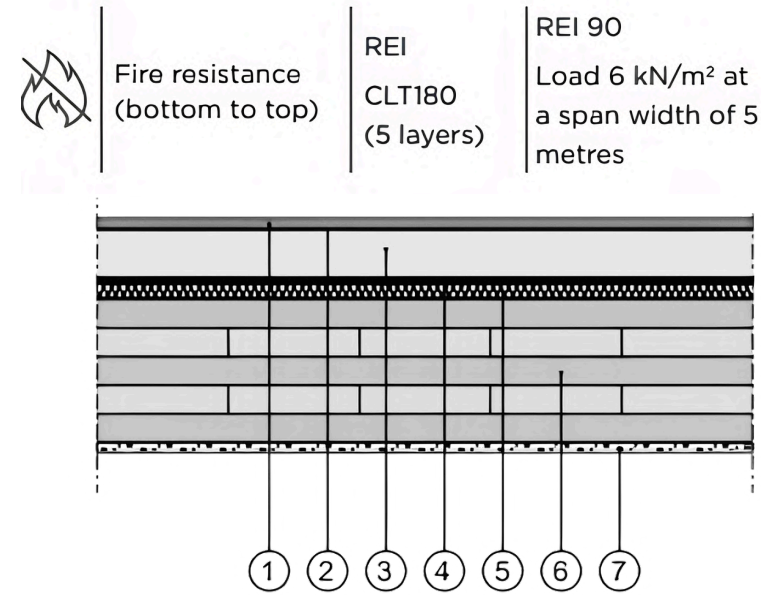
LOW-PITCHED ROOF



1. Floor covering
 2. Floor leveling compound - Weberfloor 110 fine (10 mm)
 3. Primer - Weber.vetonit MD16
 4. Reinforced board, C25/30 (100 mm)
 5. Separating layer - ISOVER 250 SL (250 mm)
 6. DOW STYROFOAM 250 SL (250 mm)
 7. Waterproofing - Weber.tec 915
 8. Concrete layer C8/10 (60-70 mm)
 9. Compacted crushed stone
 10. Compacted primer
- U-value 0.12 W/m²K)**

MBL3A

OUTER WALLS

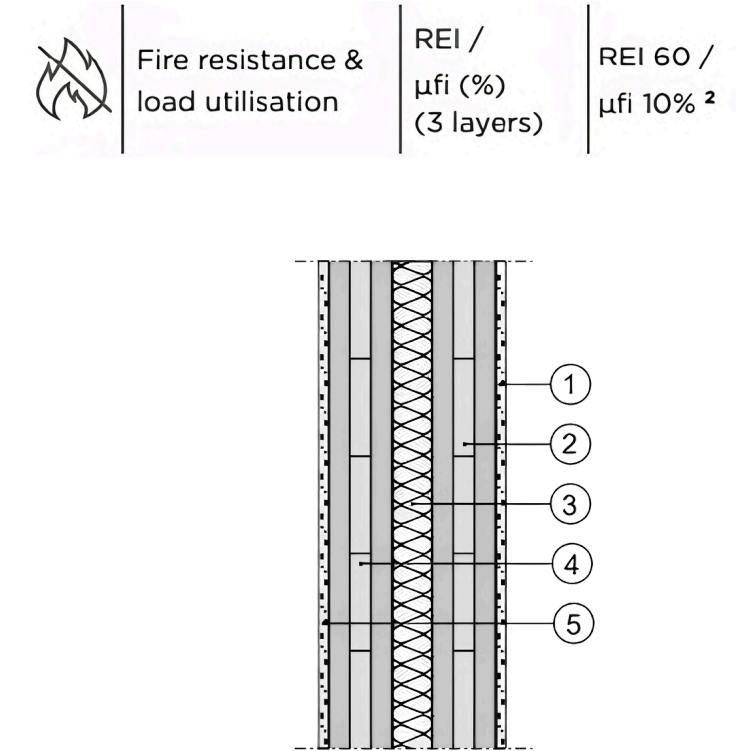


1. 14 mm Parquet
2. 2 mm Foam
3. 60 mm weberfloor 150 dura
4. 12 mm Aprobo Decibel 4
5. 20 mm Glava footstep impact sound board
6. 180 mm CLT element
7. 12.5 mm Gyproc GNE 13 Normal

| Properties and definitions | | | |
|----------------------------|-----------------------|---------------------------------------|-----------------|
| | Sound reduction | | |
| 🎧 | Footstep impact sound | $L_{n,w}$ (dB) | 54 ¹ |
| | | $L_{n,w}+C_{150-2500}$ (dB) | 58 ¹ |
| 🌐 | Airborne sound | R_w (dB) | 54 ¹ |
| | | $R_w+C_{50-3150}$ (dB) | 52 ¹ |
| 🌐 | Carbon footprint | kg CO ₂ per m ² | 34 |
| 🍃 | Weight | kg/m ² | 234 |
| ↔ | Structural thickness | mm | 301 |

IV-1

PARTITION WALLS



1. 12.5 mm Gyproc GNE 13 Normal
2. 80 mm CLT element
3. 50 mm ISOVER Cavity Wall Board 32
4. 80 mm CLT element
5. 12.5 mm Gyproc GNE 13 Normal

| Properties and definitions | | | |
|----------------------------|----------------------|---------------------------------------|-----------------|
| 🎧 | Sound reduction | R_w (dB) | 64 ¹ |
| | | $R_w+C_{50-3150}$ (dB) | 57 ¹ |
| 🌐 | Carbon footprint | kg CO ₂ per m ² | 15 |
| 🍃 | Weight | kg/m ² | 91 |
| ↔ | Structural thickness | mm | 235 |

ELEVATIONS

WEST ELEVATION

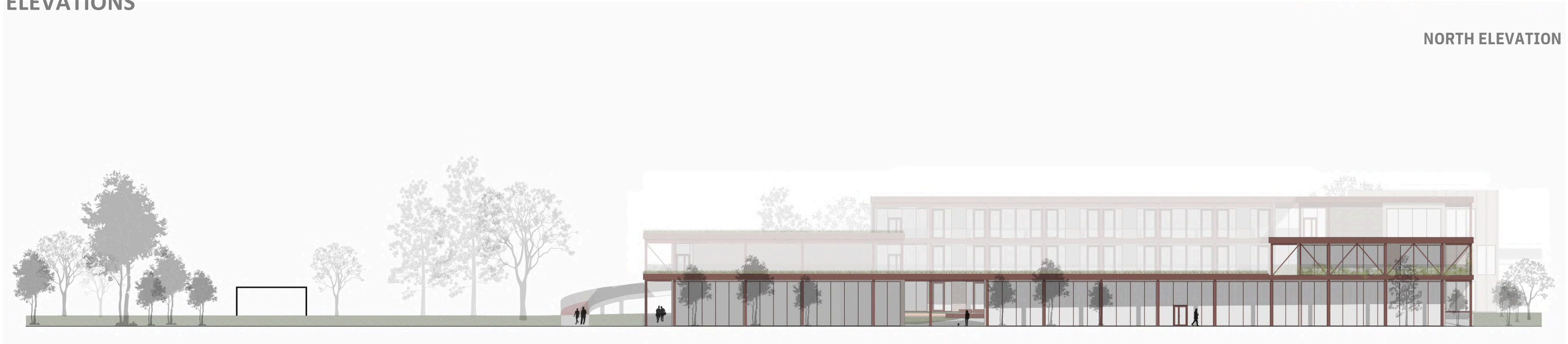


EAST ELEVATION

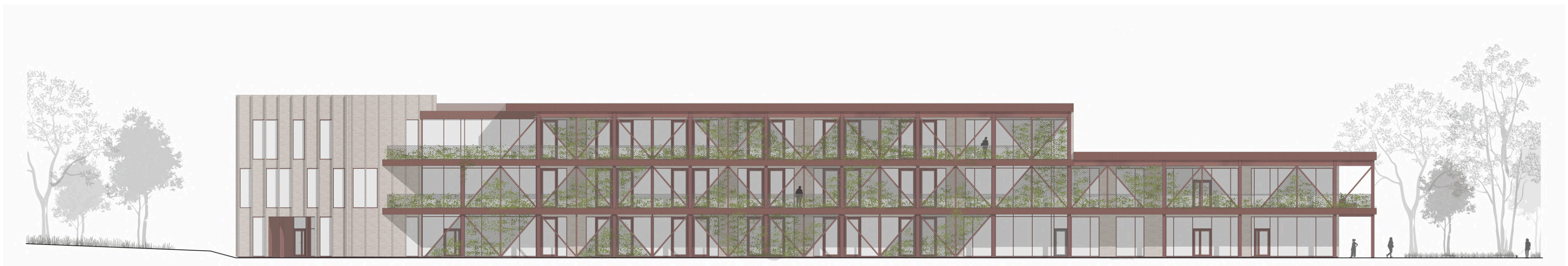


ELEVATIONS

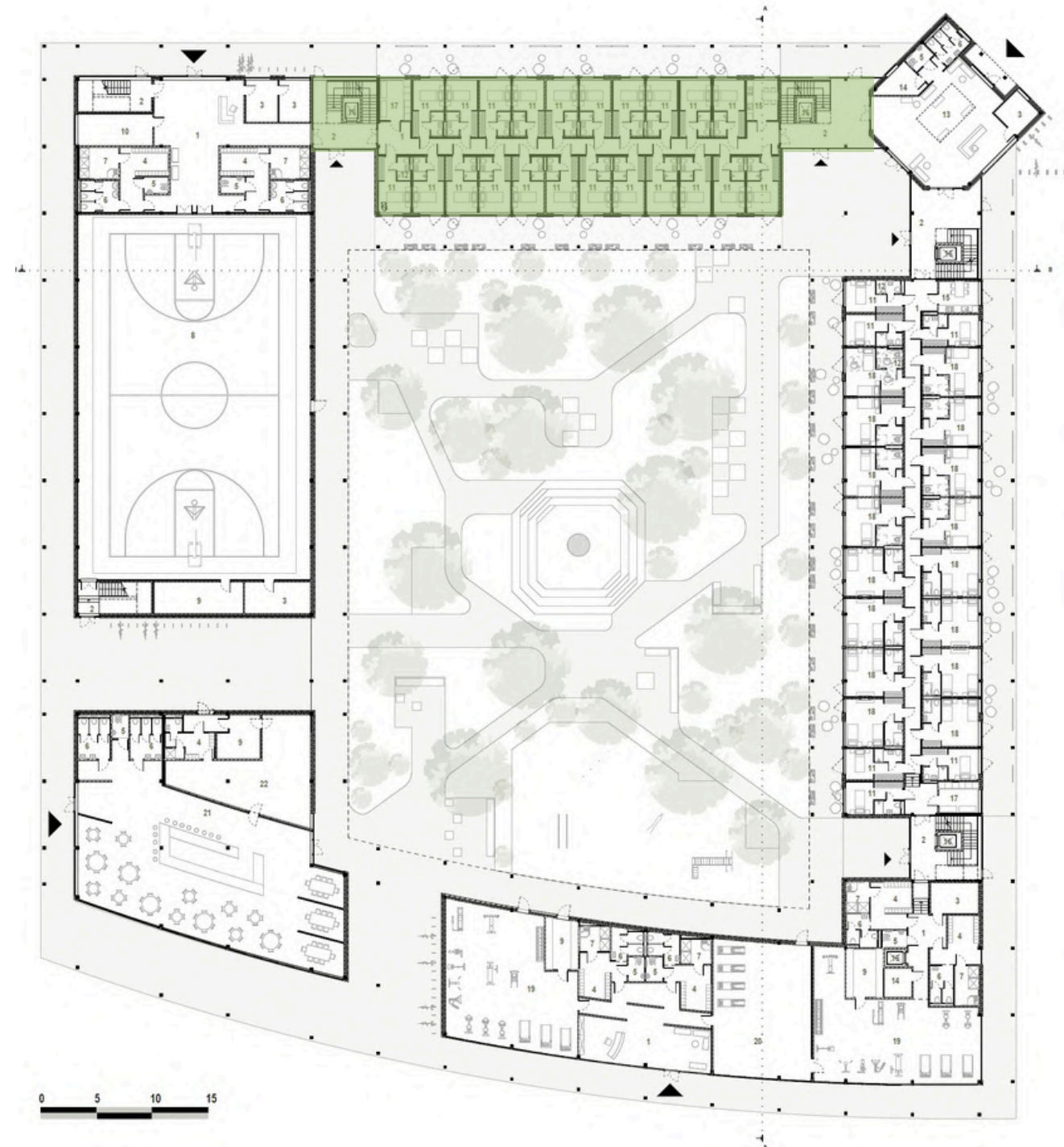
NORTH ELEVATION



SOUTH ELEVATION



PASSIVE HOUSE PLANNING PACKAGE RESULTS

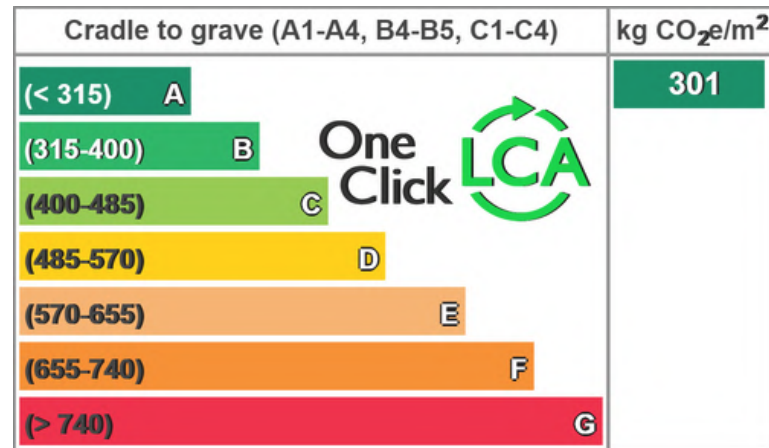


| | |
|------------------------------|------------------------|
| Projected Building Footprint | 562.6 m ² |
| Treated Floor Area | 1362.52 m ² |
| Annual Heating Demand | 13 kWh/m ² |
| Heating Load | 13 W/m ² |
| Frequency of Overheating | 7% |
| Airtightness | 0.6 n 1/h |
| Non-renewable Primary Energy | 211 kWh/m ² |
| PE Renewable demand | 140 kWh/m ² |

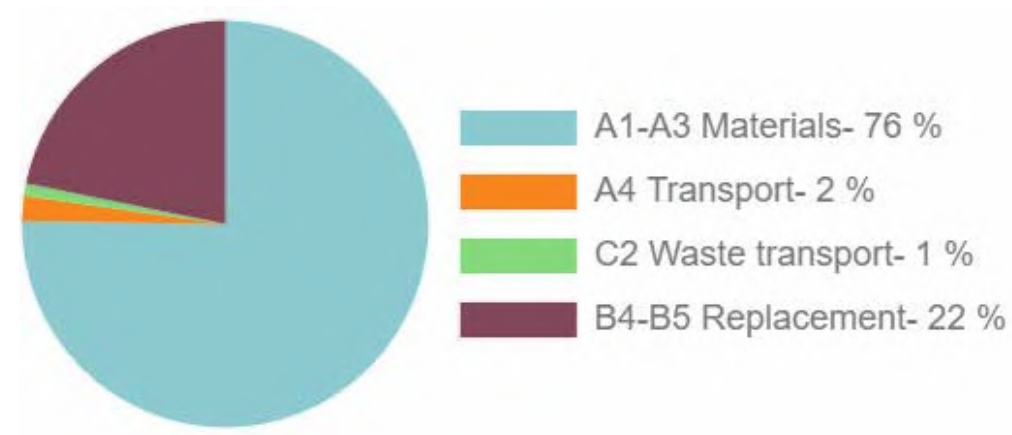
| Specific building characteristics with reference to the treated floor area | | | Criteria | Alternative criteria | Fulfilled? ² | |
|--|---|--------|----------|----------------------|-------------------------|-----|
| Space heating | Treated floor area m ² | 1362.5 | | | | |
| | Heating demand kWh/(m ² a) | 13 | ≤ | 15 | - | yes |
| | Heating load W/m ² | 13 | ≤ | - | 10 | yes |
| Space cooling | Cooling & dehum. demand kWh/(m ² a) | - | ≤ | - | - | - |
| | Cooling load W/m ² | - | ≤ | - | - | - |
| | Frequency of overheating (> 25 °C) % | 7 | ≤ | 10 | - | yes |
| | Frequency of excessively high humidity (> 12 g/kg) % | 0 | ≤ | 20 | - | yes |
| Airtightness | Pressurization test result n ₅₀ 1/h | 0.6 | ≤ | 0.6 | - | yes |
| Non-renewable Primary Energy (PE) | PE demand kWh/(m ² a) | 211 | ≤ | 120 | - | no |
| Primary Energy Renewable (PER) | PER demand kWh/(m ² a) | 140 | ≤ | - | - | - |
| | Generation of renewable energy (in relation to projected building footprint area) | 0 | ≥ | - | - | - |

LYFE CYCLE ASSESSMENT

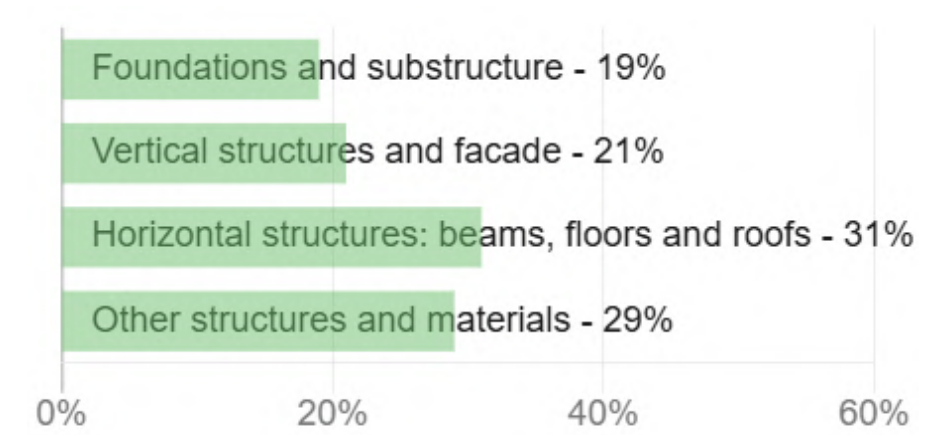
Embodied carbon benchmark



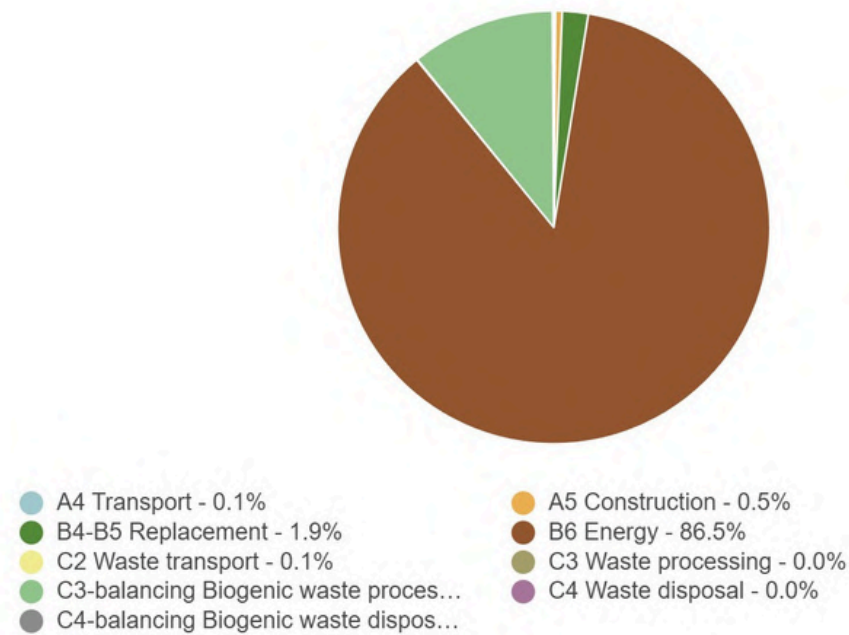
Embodied carbon by life-cycle stage



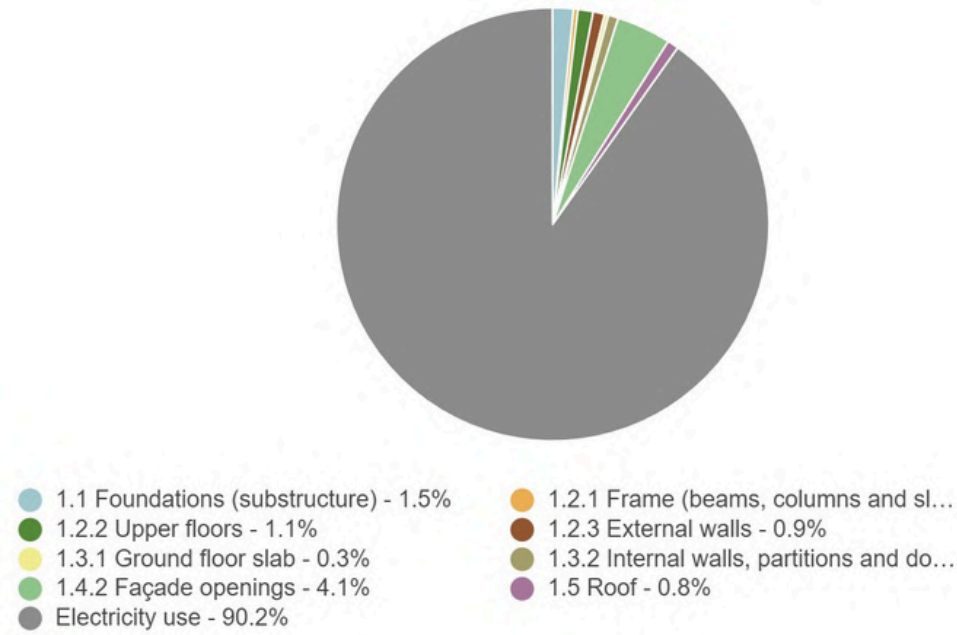
Embodied carbon by structure - A1-A3



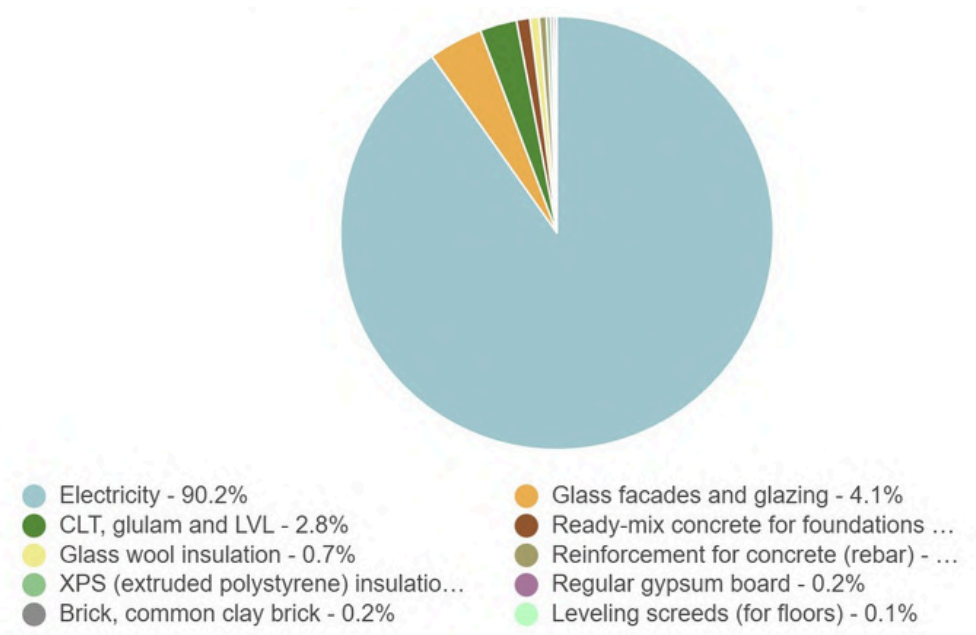
Type: Hotels and similar buildings
Life-cycle stages



Global Warming Potential total kg CO₂e :
Classifications

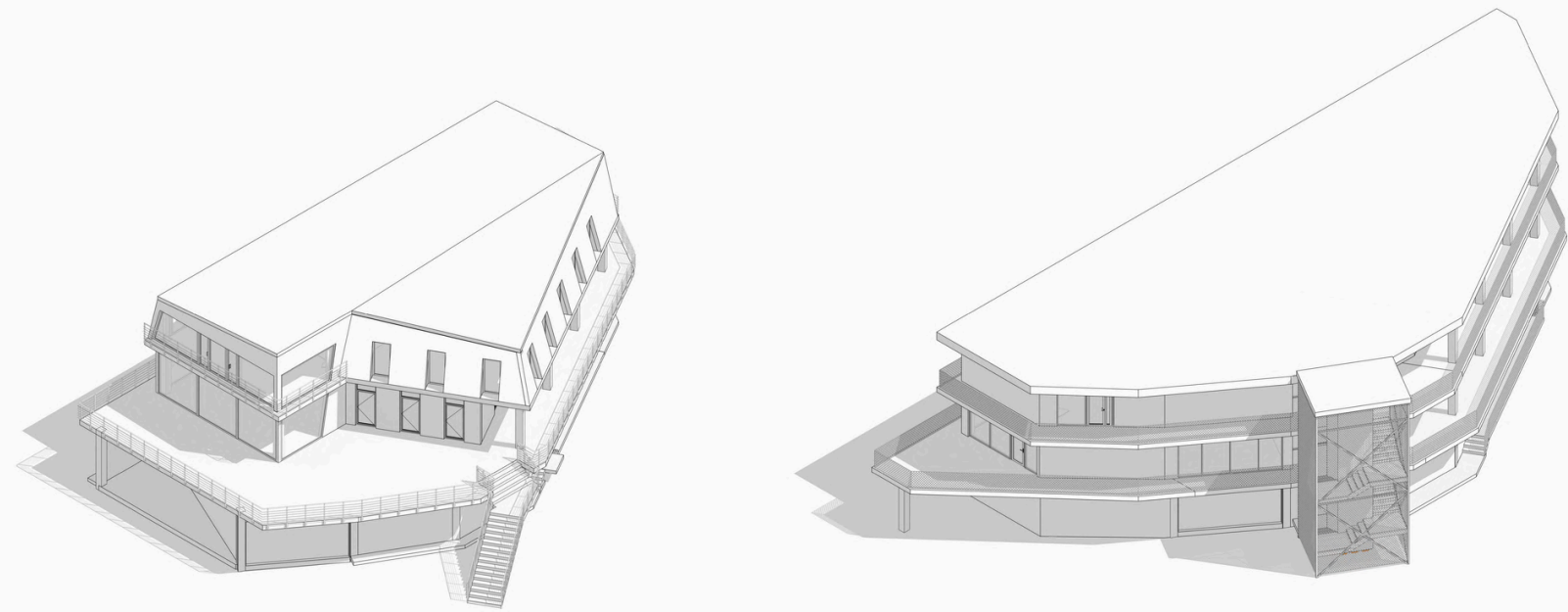


Resource types



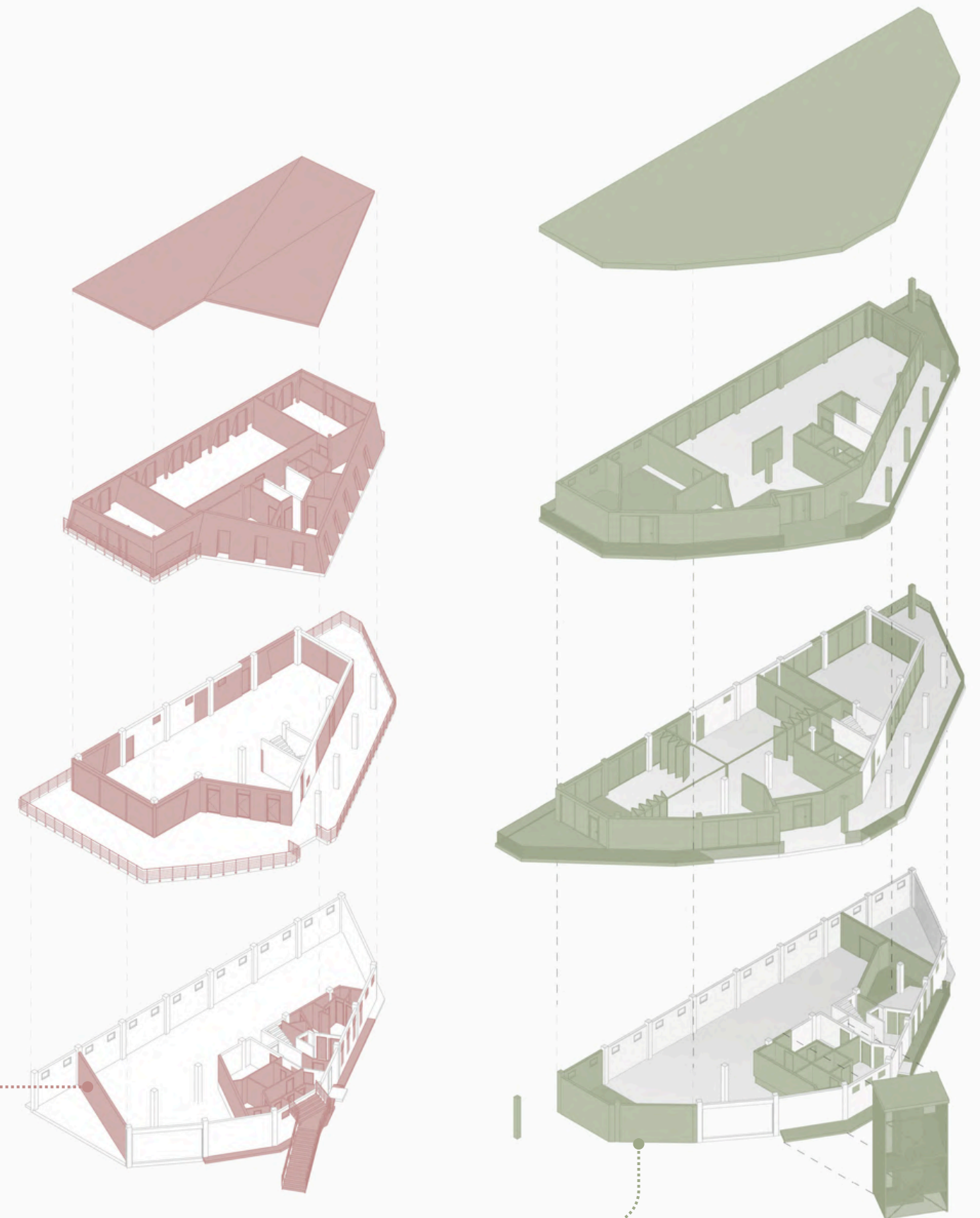
RENOVATION. ZONE B

We propose an expansion of the building, preserving the building's characteristic shape and character, but making it suitable for modern functions. On the ground floor, larger locker rooms and a warehouse have been created, leaving it for the use of employees. On the 1st floor, multifunctional rooms for events and seminars, a gym and a small kitchen are located. On the 2nd floor, we propose to place a restaurant with a magnificent view of the new athletic complex and the river. The 1st and 2nd floors have been made accessible by adding a new volume to the building with an elevator and stairs, which architecturally resonate with the architecture of Building A.



DEMOLISHED ELEMENTS

NEW ELEMENTS

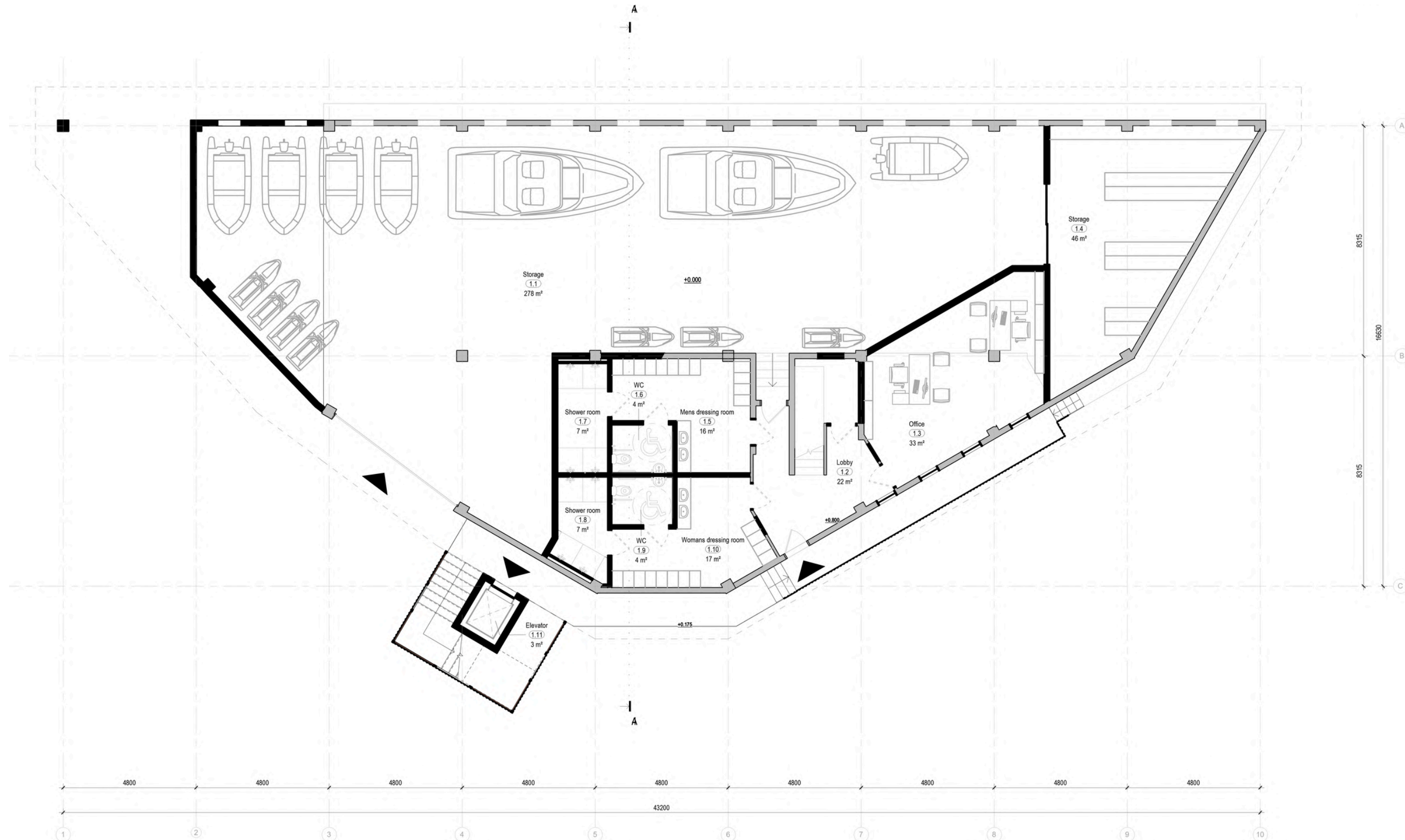


RENOVATION. ZONE B



PLANS

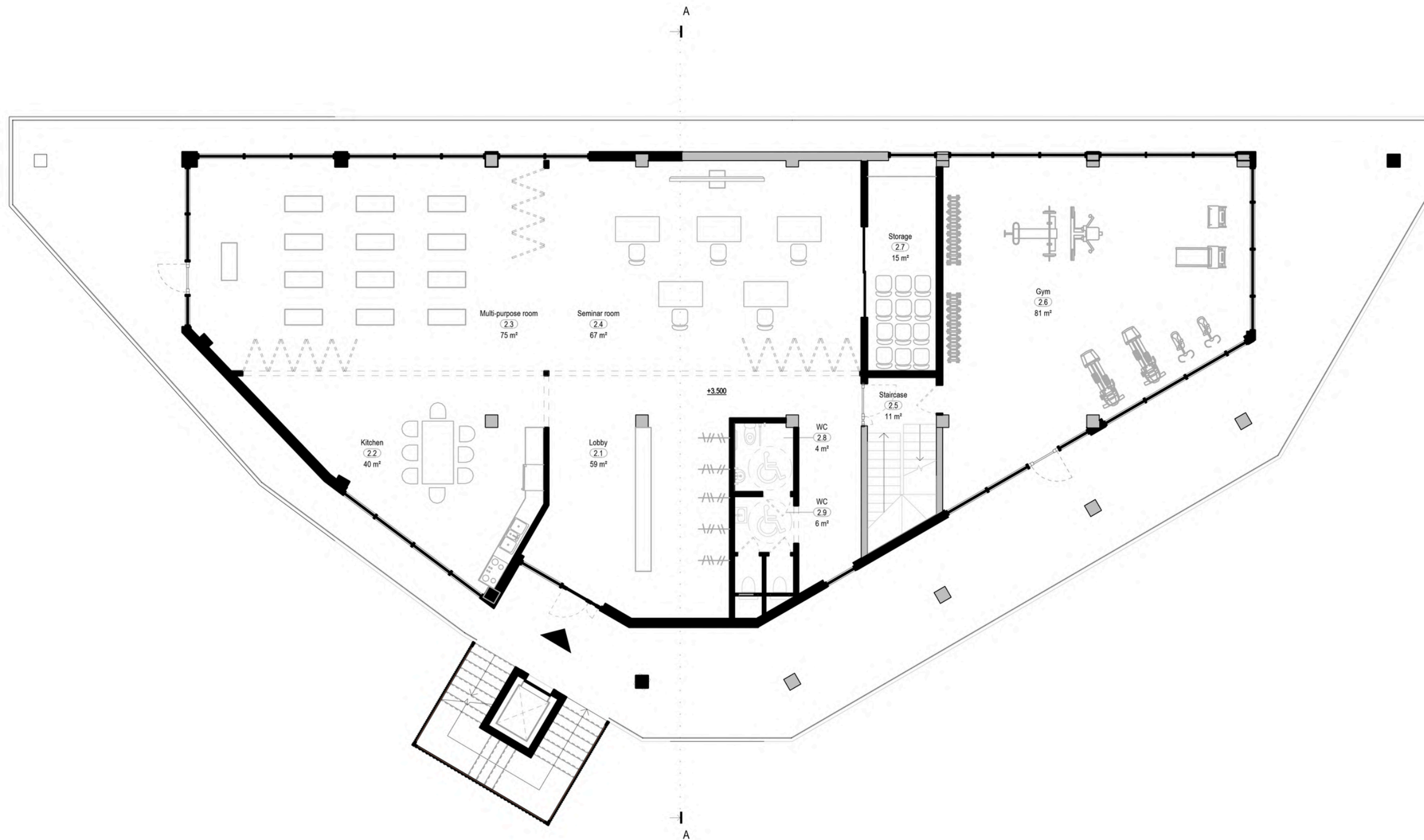
GROUND FLOOR PLAN



| Ground floor | | |
|---------------|----------------------|----------------------|
| No. | Name | Area, m ² |
| 1.1 | Storage | 278 |
| 1.2 | Lobby | 22 |
| 1.3 | Office | 33 |
| 1.4 | Storage | 46 |
| 1.5 | Mens dressing room | 16 |
| 1.6 | WC | 4 |
| 1.7 | Shower room | 7 |
| 1.8 | Shower room | 7 |
| 1.9 | WC | 4 |
| 1.10 | Womans dressing room | 17 |
| 1.11 | Elevator | 3 |
| Totals | | 437 |

PLANS

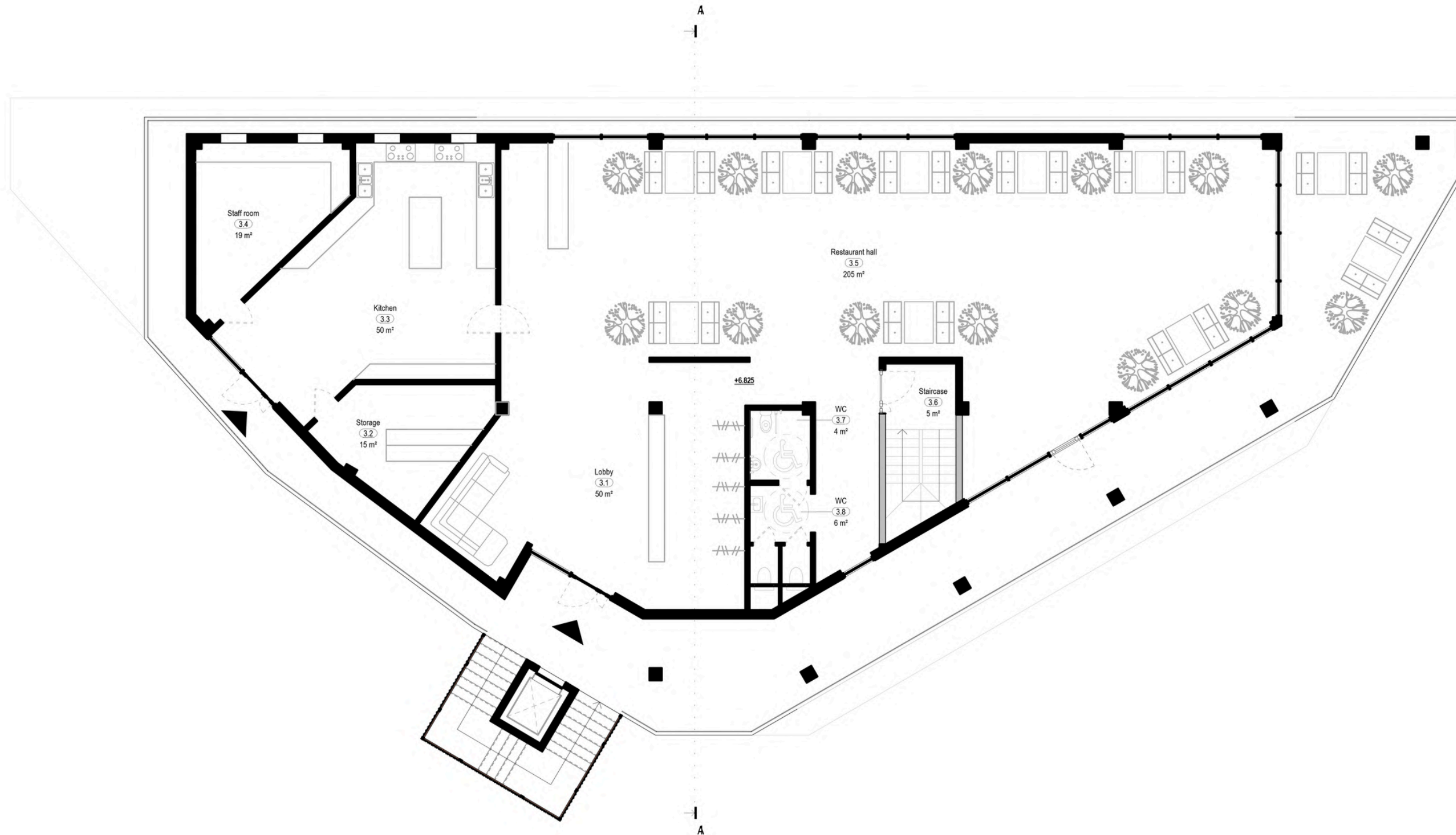
1ST FLOOR PLAN



| 1st floor | | |
|---------------|--------------------|------------|
| No. | Name | Area, m2 |
| 2.1 | Lobby | 59 |
| 2.2 | Kitchen | 40 |
| 2.3 | Multi-purpose room | 75 |
| 2.4 | Seminar room | 67 |
| 2.5 | Staircase | 11 |
| 2.6 | Gym | 81 |
| 2.7 | Storage | 15 |
| 2.8 | WC | 4 |
| 2.9 | WC | 6 |
| Totals | | 358 |

PLANS

2ND FLOOR PLAN



| 2nd floor | | |
|-----------|-----------------|----------------------|
| No. | Name | Area, m ² |
| 3.1 | Lobby | 50 |
| 3.2 | Storage | 15 |
| 3.3 | Kitchen | 50 |
| 3.4 | Staff room | 19 |
| 3.5 | Restaurant hall | 205 |
| 3.6 | Staircase | 5 |
| 3.7 | WC | 4 |
| 3.8 | WC | 6 |
| Totals | | 354 |

SECTION

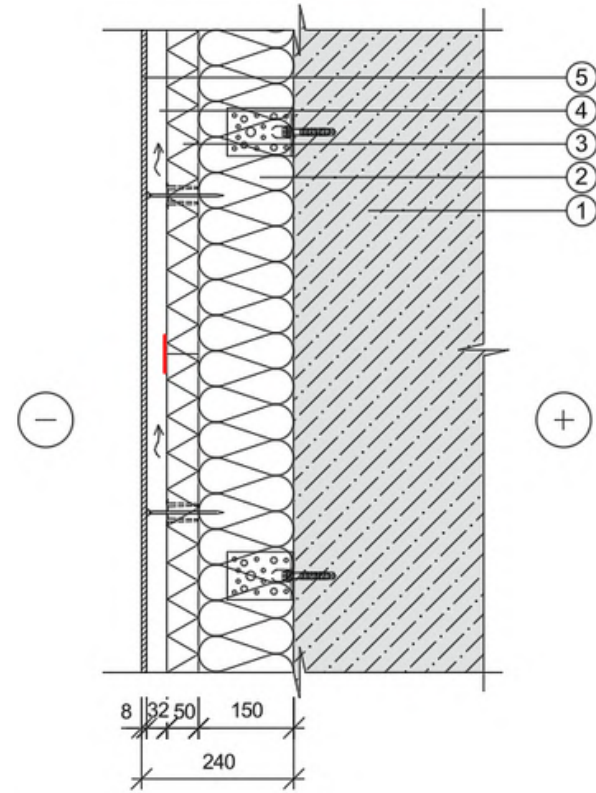


1ST FLOOR



MATERIALS AND SPECIFICATIONS

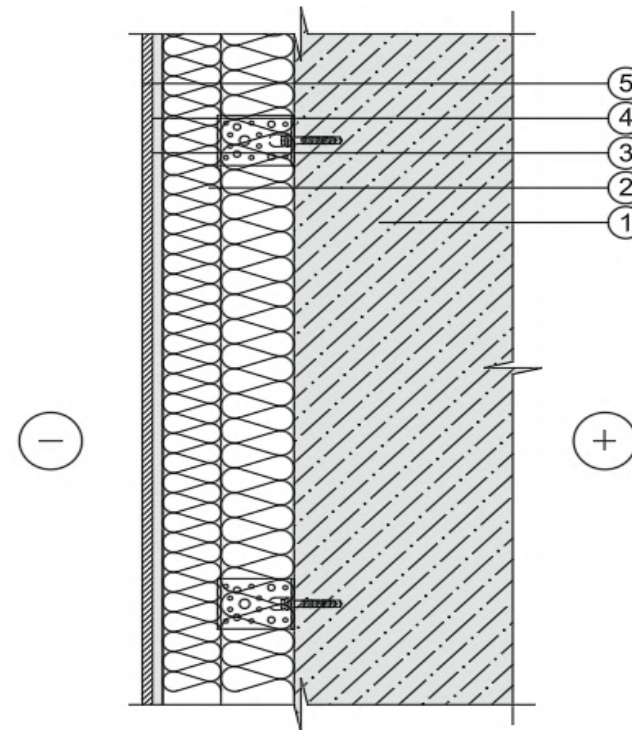
OV1 WALL INSULATION



1. Existing reinforced concrete wall
2. Vertical wooden battens (pitch ≤ 600) (50x50 mm)/ thermal insulation ISOVER PREMIUM 33 (150 mm)
3. Wind insulation ISOVER FACADE (50 mm)/ adhesive tape on the seams ISOVER FACADE TAPE (width 60 mm)
4. Cladding battens (32x50 mm)/ self-adhesive EPDM tape (width 50/90 mm)
5. Fiber cement board (8 mm)

U-value 0.17 W/m²K)

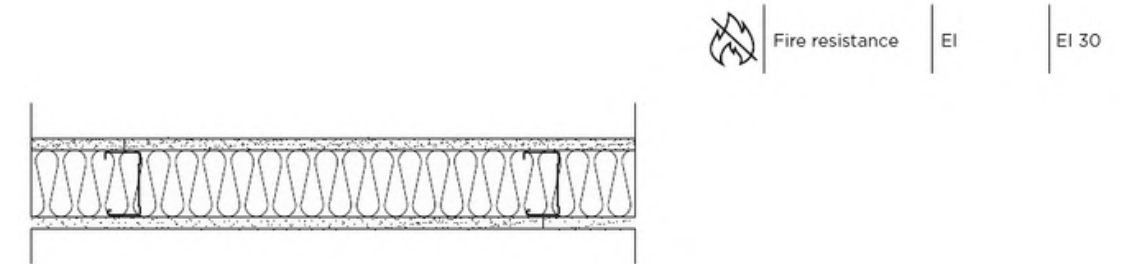
OV2 WALL INSULATION







1. Existing or new masonry wall
2. 100+80 mm webertherm 371
3. 20 mm webertherm 344
4. 3 mm weber flex fix/ – weber coloured masonry mortar M2.5
5. 14 mm weber design bricks

U-value 0.17 W/m²K)

IV16 INNER WALLS



1. 12.5 mm Gyproc GNE 13 Normal
2. 70 mm Gyproc ER 450 with
3. 70 mm ISOVER Piano® Sound Board, centre distance 450
4. 12.5 mm Gyproc GNE 13 Normal

| Properties and definitions | | | |
|---|----------------------|---------------------------------------|-----------------|
|  | Sound reduction | R _w (dB) | 42 ¹ |
|  | Carbon footprint | kg CO ₂ per m ² | 10 |
|  | Weight | kg/m ² | 21 |
|  | Structural thickness | mm | 95 |

ELEVATIONS

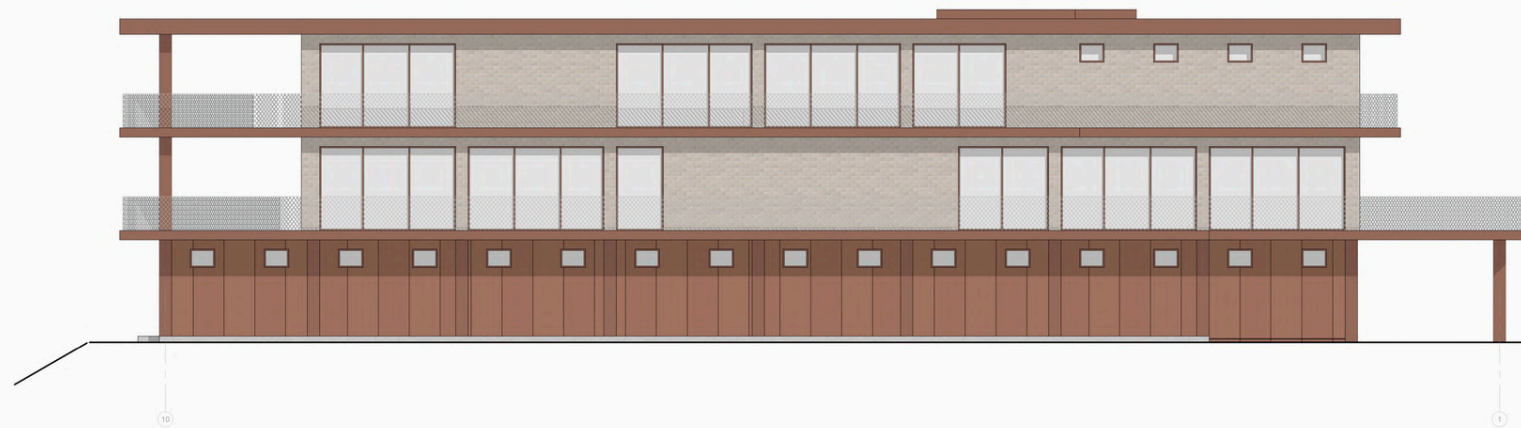
EAST ELEVATION



WEST ELEVATION



NORTH ELEVATION



SOUTH-WEST ELEVATION

