Sustainable Student Housing

The Metropolitan City of Milan–Segrate

Marconi District adjacent to Green Kilometre

Eco–Loop

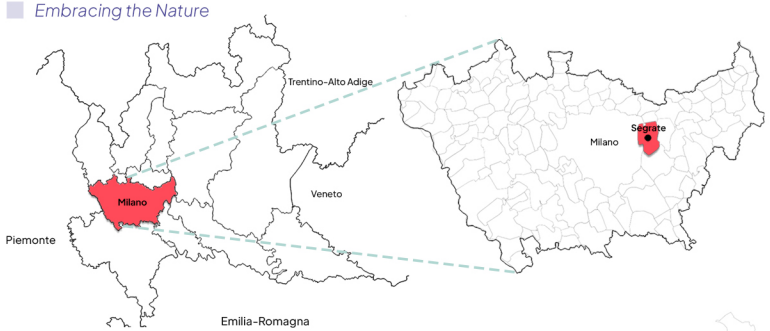
“Stitching Nature Through Industry

Embracing the Nature

Team Alpha Vortex

Eco-Loop | "Stitching Nature Through Industry

Embracing the Nature



Milan – A city where historical heritage and modern development coexist, shaping a dynamic urban environment. Its dense network of streets, diverse architectural styles, and well-planned green spaces reflect a balance between tradition and innovation, making it a model for contemporary urban living.

Segrate – A suburban extension of Milan characterized by a mix of residential areas, business districts, and large public spaces. Its strategic location, efficient infrastructure, and integration of natural elements contribute to its role as a key urban link within the metropolitan area, fostering sustainable growth and connectivity.

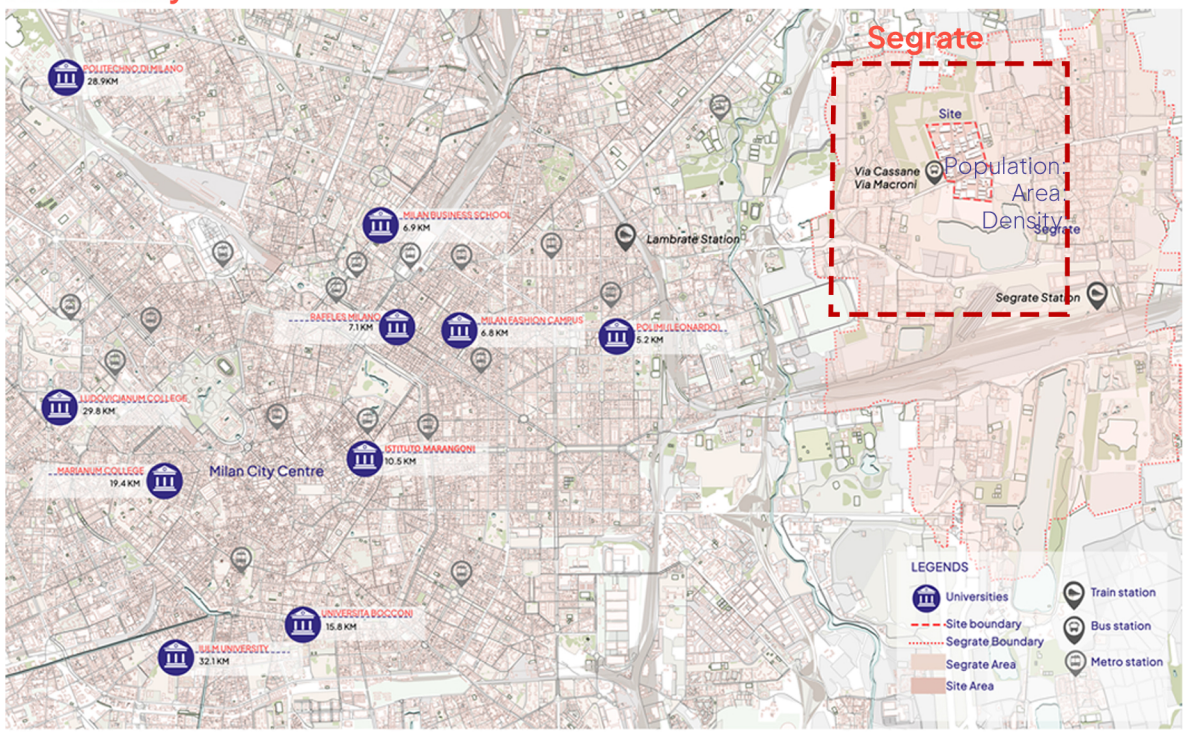
Milan Metropolitan City

Population: **3,218,201** residents.
Area: **1,575** square kilometers.
Density: **2,044** inhabitants per square kilometer.

Segrate

Population: **37,088** residents
Area: **17.49** square kilometers.
Density: **2,121** inhabitants per square kilometer.

Accessibility



The site in Segarte is connected to Milan's main educational institutes hubs through metro lines, suburban trains, and bus routes. Average commuting time ranges between 20 to 40minutes.

Students can travel to Lambrate station (M2 Green Line)

Lambrate station to Segrate station (S5, S6) and then can take bus

Several direct bus route from city centre and metro connects to segrate and then to the site.

Personal vehicle or E scooters or bike.

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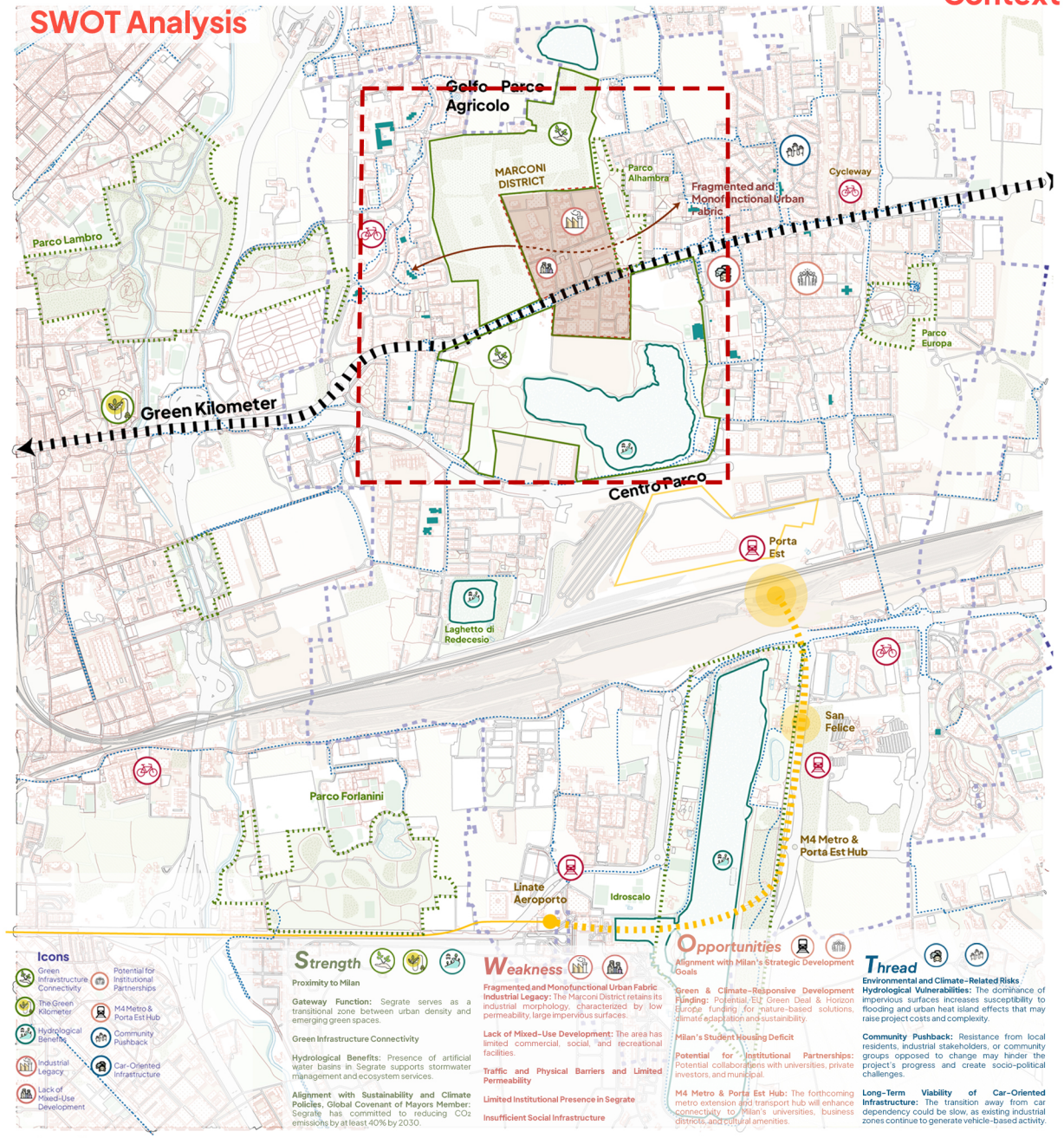
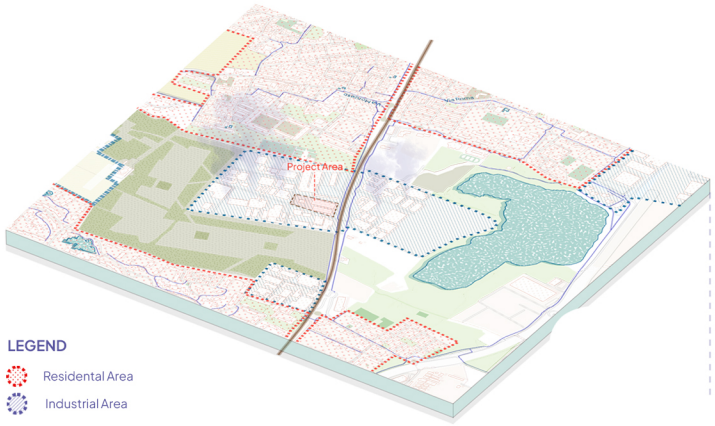
SWOT Analysis

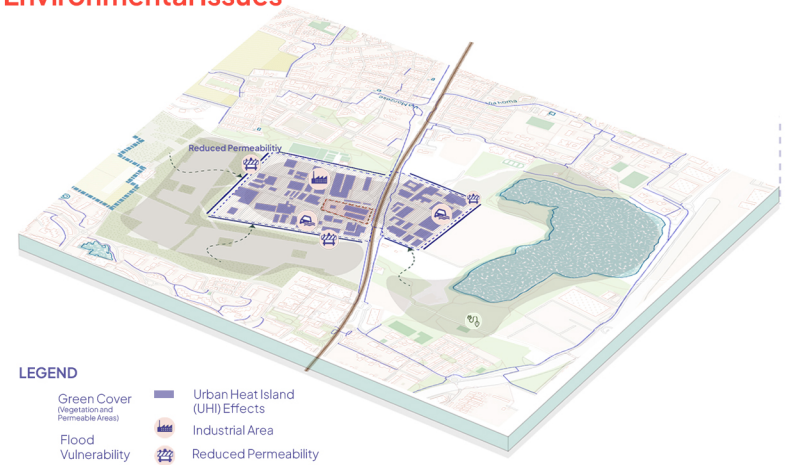


Spatial Map Usage



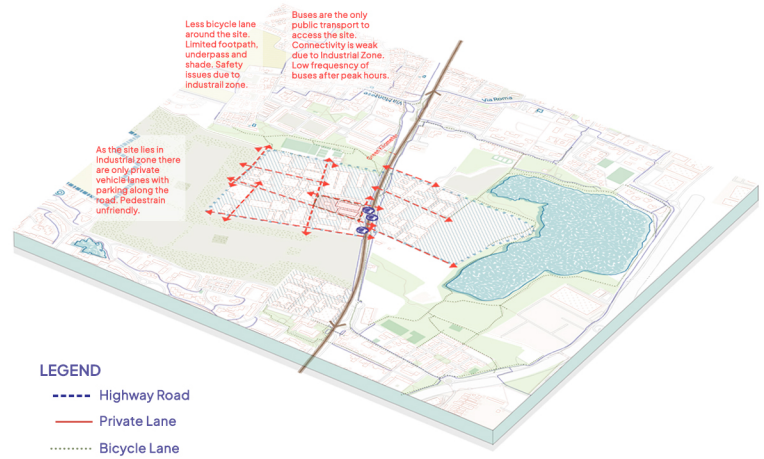
Marconi District: Spatial Usage
The spatial usage analysis of the Marconi District reveals a predominantly industrial character, with large scale warehouses, paved lots, and fragmented public spaces. The area is marked by a monofunctional layout, dominated by impermeable surfaces, minimal green cover, and limited pedestrian connectivity. Despite its current industrial use, the site shows strong potential for transformation due to its proximity to key ecological assets (CentroParco and Golfo Agricolo) and upcoming transit infrastructure.

Environmental Issues



The Marconi District shows high environmental stress, with high level impervious surfaces contributing to urban heat island effects and poor stormwater absorption. In contrast, nearby CentroParco and Golfo Agricolo, with over 70% green cover, offer natural cooling and ecological benefits. Sparse vegetation in Marconi and low-lying areas near Golfo face higher flood risks due to limited permeability and drainage. These conditions highlight the urgent need for green corridors and ecological connections to restore resilience and improve climate performance.

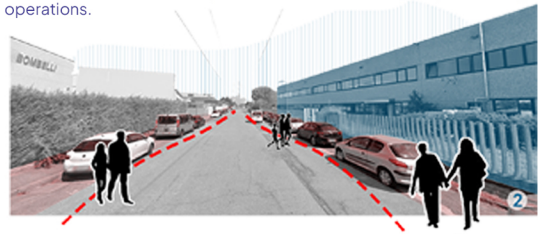
Mobility Challenges



Streets of Maconi District



The proximity to active industrial facilities may result in daytime noise disturbances due to heavy vehicle traffic and ongoing machinery operations.



There is no pedestrian infrastructure, such as walking paths or sidewalks, in the Marconi area and within the project site.



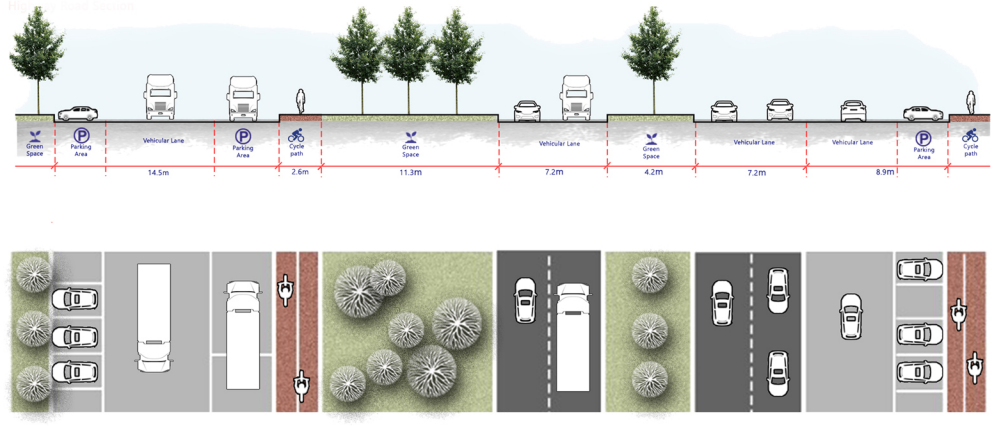
Currently, there is no bicycle path providing access to either the Marconi area or, the project site.



Parked vehicles along the roadways block access to green spaces near the project site, reducing overall accessibility.

Industrial Area Section

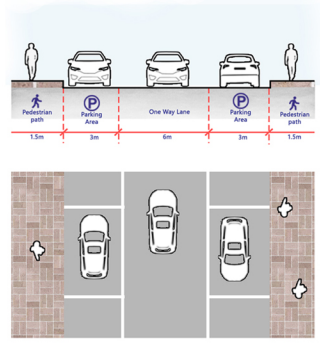
in the existing road there is no pedestrian zone, also there is no cycle lane near industrial zone. Additionally, due to heavy trucks and vehicle, and traffic during rush hours it is difficult to cross the road. Moreover There is less cross walk way.



Current Situations

Highway Section

The Streets in the Industrial zone are very narrow. Also, car parking are present along the road, which results in conjusted road. There were no green spaces, no shaded places. also pedestrain path also has weak connection.



Strategies and Goals



Regulations

URBAN PLANNING REGULATIONS : (Piano di Governo del Territorio- PGT)

ZONING AND LAND USE

Zoning and Land use: The site falls under the D2 zoning category: "Production areas with the possibility of functional reconversion. Permitted uses include student housing and compatible services. Prohibited uses encompass large retail structures, clinics, logistic centers, open sir material storage, hotels and agricultural activities.

URBAN REGENERATION AREA

Urban Regeneration Area:
The area is designated for urban regeneration, allowing for functional conversions that enhance compatibility with the surrounding urban fabric.

URBUN PLANNING PARAMETERS

Urban Planning Parameters: Building Index (If): **0.6 m²/ m²**, indicating that the maximum gross floor area can be 60% of the site area. **Coverage Ratio (Rc): 50%**, meaning at least 50% of the site must remain unbuilt.
Maximum Building Height: 25 meters. Biotope Area Factor (**BAF): Minimum of 0.4**, promoting green infrastructure and soil permeability.

Coverage Ratio

Setback Requirements: New building must maintain a minimum distance of: **7.5** meters from roads. 10 meter from private buildings. **5 meters** from the boundary with the private part of the site.The distance between buildings must be equal to or greater than the height of the tallest building.

SETBACK REQUIREMENTS

BUILDING REGULATIONS

BUILDING REGULATIONS

Ministerial Decree No.1437/2022:
Single Rooms: Minimum of 100 single rooms, each at least 11.7 m² net area (including bed space and bathroom).
Accessibility: At least 5% of rooms must be accessible, with increased space for accessibility needs (at least 10%).

CONSTRUCTIVE MATERIALS AND SUSTAINABILITY

Shared Spaces: A minimum of 4.3 m² per bed space must be allocated for shared areas, including cultural, educational, recreational, support, and administrative services.

Constructive Materials and Sustainability: Use of natural materials for structures and finishes is encouraged.

ENVIRONMENTAL AND SUSTAINABLITY CONSIDERATIONS
Climate Commitments: Segrate has committed to reducing CO_2 emission by at least 40% by 2030, focusing on energy efficiency and renewable energy sources.

ENVIRONMENTAL AND CUSTAINABILITIY CONSIDERATIONS

Urban Cooling and Green Infrastructure: Project should aim to reduce the 'heat island' effect through urban forestation and increased green areas. Creation of a 'Sponge city' through depaving, reducing hydraulic risk and decreasing rainwater inflow to the sewerage system.

Biotope Area Factor

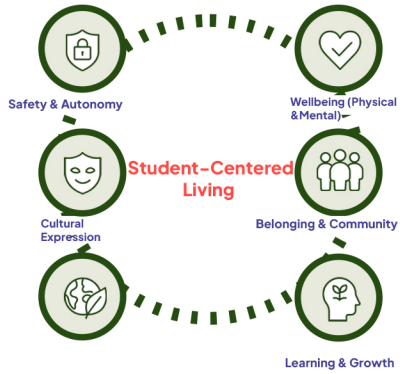
Biotope Area Factor (BAF): A minimum BAF of 0.4 is required, enhancing soil permeability and ecological value.

Eco-Loop | "Stitching Nature Through Industry

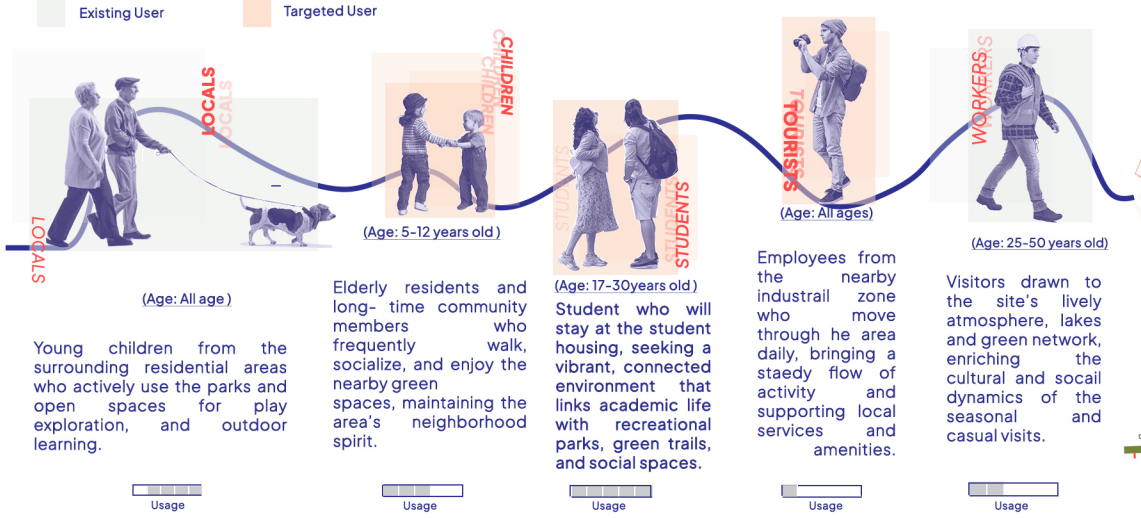
Embracing the Nature

Objectives

This project aims to regenerate the Marconi district through an integrated approach that combines ecological connectivity, adaptive reuse, and community-centered design. At the macro scale, an ecological loop connects major green assets across Segrate, while at the micro scale, green corridors link CentroParco and Golfo Agricolo to improve local climate and pedestrian mobility. The proposal emphasizes passive energy strategies, multi-modal transport integration, and the transformation of industrial spaces into sustainable, mixed-use environments. Through participatory planning and measurable sustainability goals, the project supports resilient urban development that enhances environmental quality and social cohesion.



User Typology



Urban Comfort Strategies



NOISE MONITORING
Monitoring sound levels of road and industrial buildings to manage noise pollution.



SOCIAL SEATING
Designing seating to encourage gathering and casual interaction.



EXERCISE EQUIPMENT
Promoting outdoor fitness with accessible workout stations in surrounding park



INTERACTIVE DISPLAY
Providing real-time info and services.

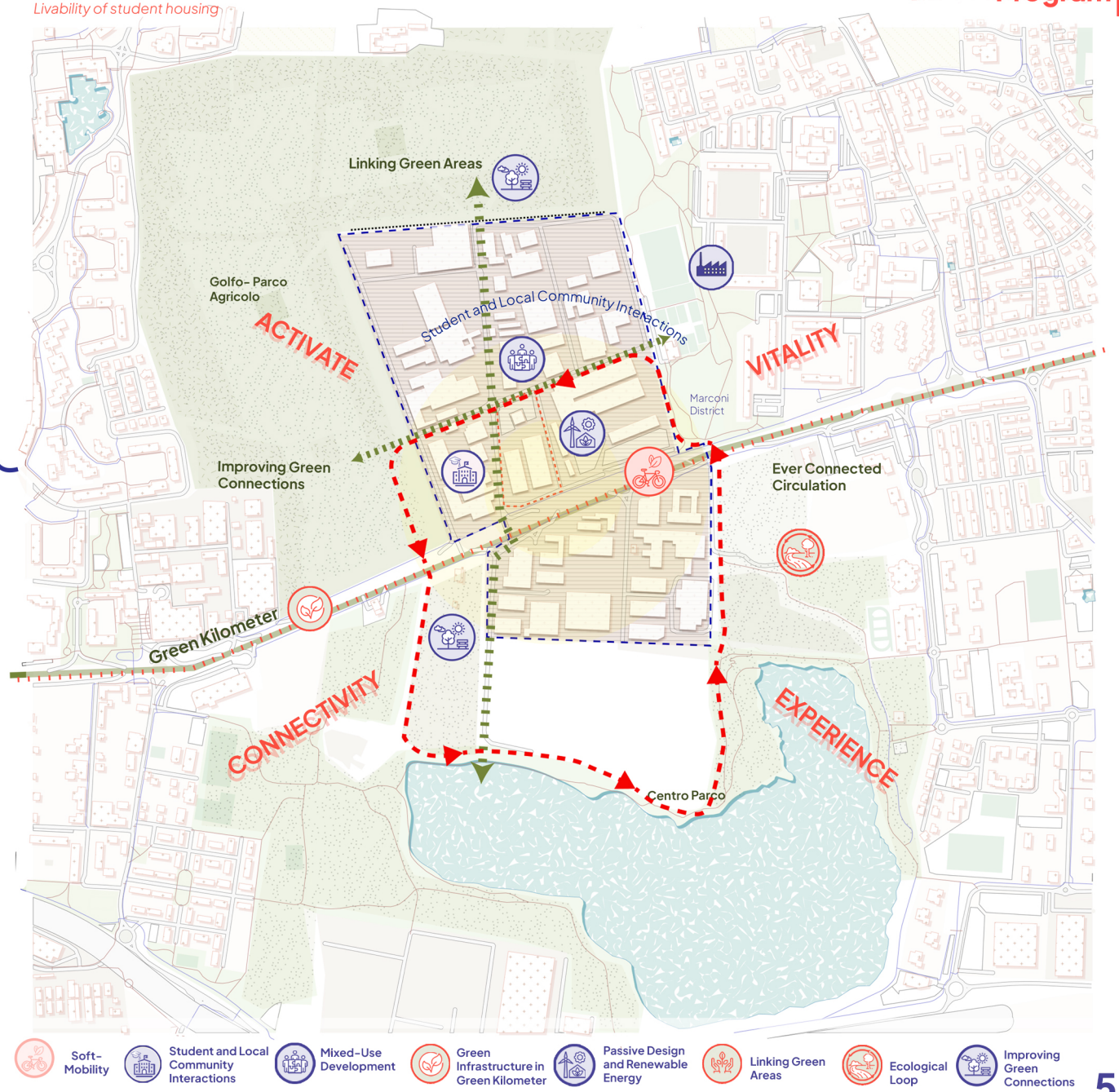


AIR QUALITY MONITORING
Tracking industrial pollution levels with live environmental sensors.

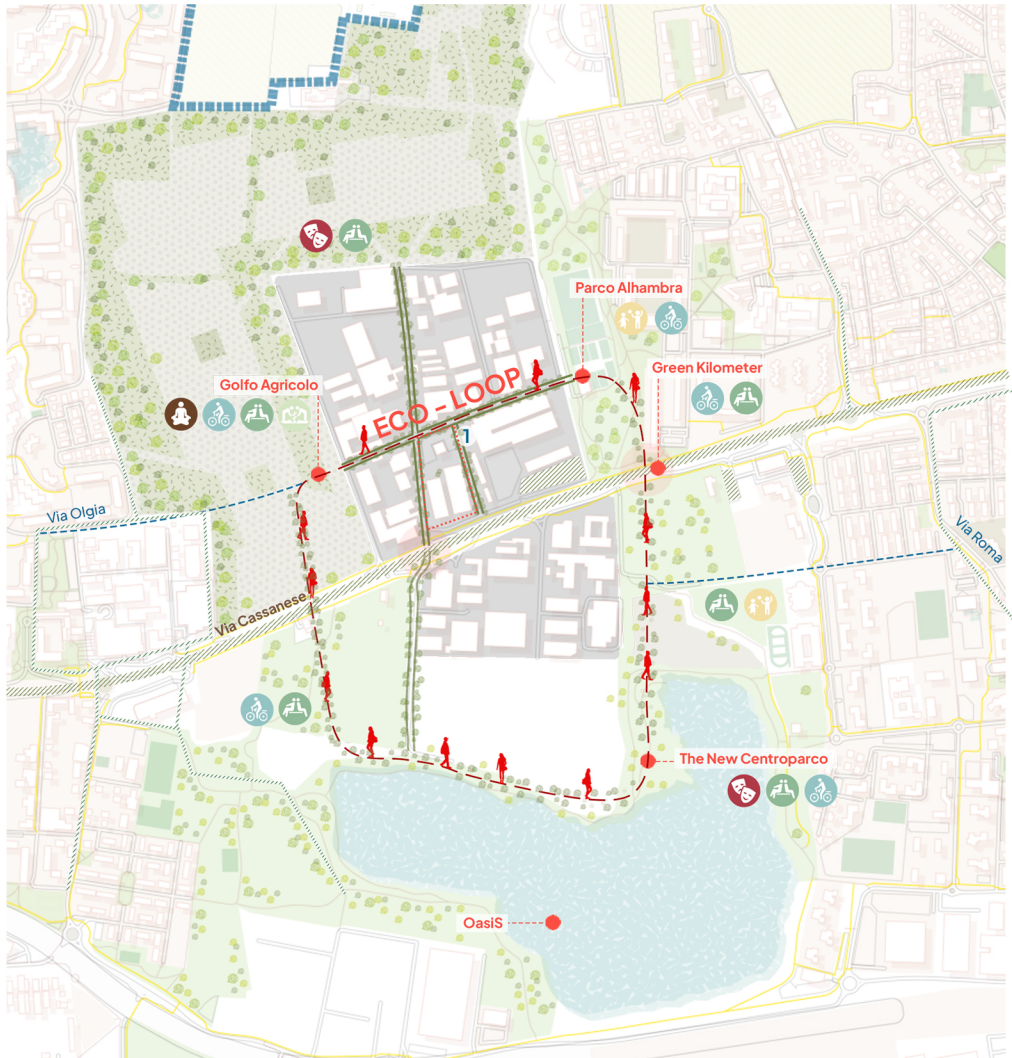


WAYFINDING
Using digital signs to help people navigate easily in public spaces.

Livability of student housing



Ecological Loop-Neigbourhood Level



BIKE / ROLL / SKATE
This part of the loop is designed for fast and fun movement. It includes bike lanes, skate-friendly paths, and smooth surfaces for scooters or rollerblades. Students can ride between housing, campus, and transport stops.

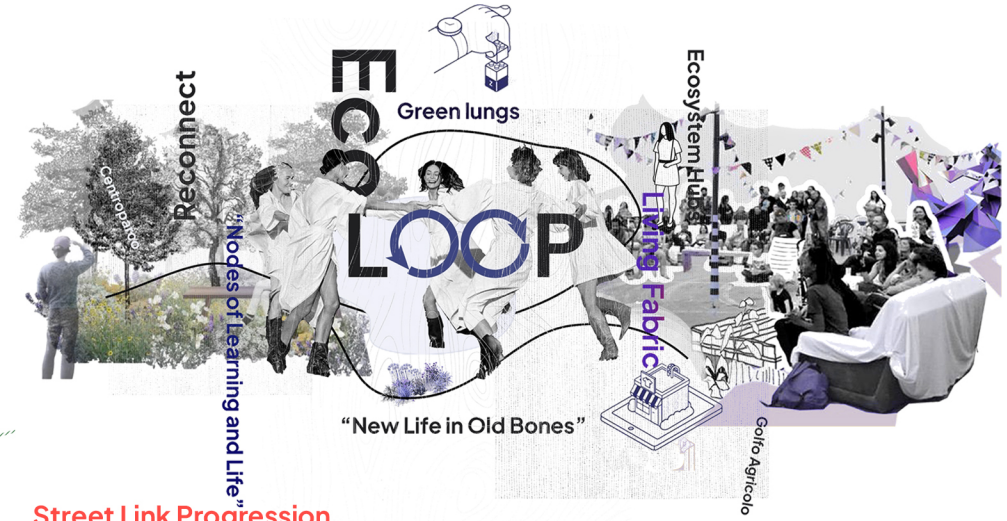
PLAY / CLIMB / EXPLORE
The public playground is designed for local families and younger children, adding a social mix to the student environment.

GROW / GARDEN / REST
This part of the loop is a quiet green zone where students can grow herbs, vegetables, or flowers. It's a shared garden space for relaxing, planting, and spending time in nature.

BREATHE / STRETCH / MEDITATE
This is the quiet zone of the loop, designed for calm and well-being. With soft landscaping, shaded seating, and open decks for stretching, yoga, or just relaxing alone.

PAUSE / MEET / REST
This area of the loop is made for relaxing and socializing. There are shaded seating spots, picnic tables, and small open lawns where students can gather, study outside, or take a break.

PLAY / PERFORM / WATCH
This area of the loop is for fun, creativity, and social energy. It includes open lawns for games, a small stage for performances, and seating steps where students can hang out or watch events.



Concept

Eco-Loop

The Eco-Loop is a continuous green corridor that encircles the Marconi industrial district and forges seamless connections between Segrate's principal natural assets—Golfo Agricolo, the Green Kilometre, and the new CentroParco. As it winds around the old warehouses and paved expanses, it unfolds through six distinct "moments" that cater to diverse user needs.By sequencing mobility, social respite, ecological engagement, and recreational programming along one continuous loop, the design both animates the student housing campus and stitches the fragmented industrial fabric into a resilient, multifunctional "living belt."

Street Link Progression

Before



The green areas around our site, such as Golfo Agricolo and the nearby park, were isolated and disconnected from each other, the main road, and the industrial zone, lacking an integrated ecological or pedestrian network.

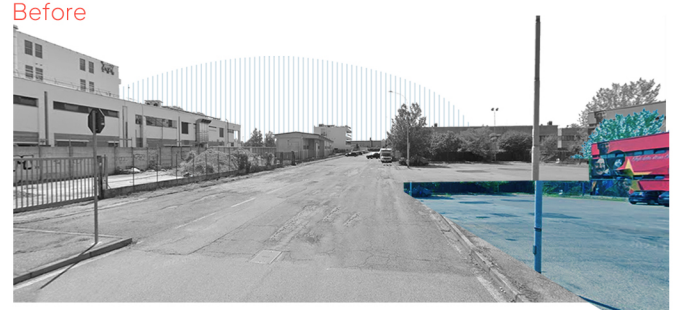
After



By referencing the existing Green Kilometer project, we connected Golfo Agricolo, a nearby park, and our site to the main road through green corridors. These links were extended into the industrial zone, forming a continuous and accessible green network

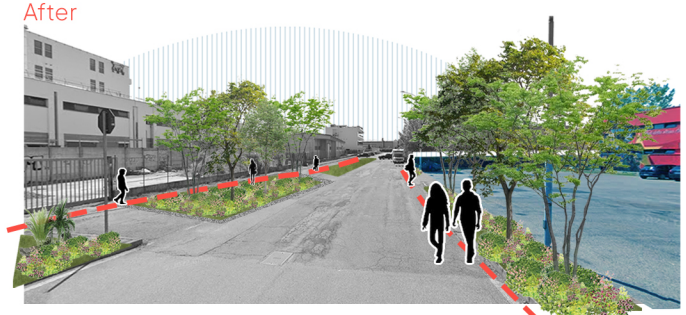
Luigi Galvani Street

Before



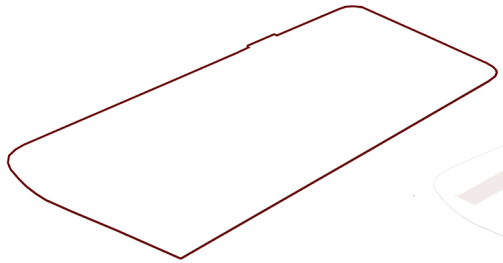
The Marconi District features wide streets that are frequently used as informal parking areas. Additionally, the front zones of many industrial facilities are largely vacant and remain underutilized.

After



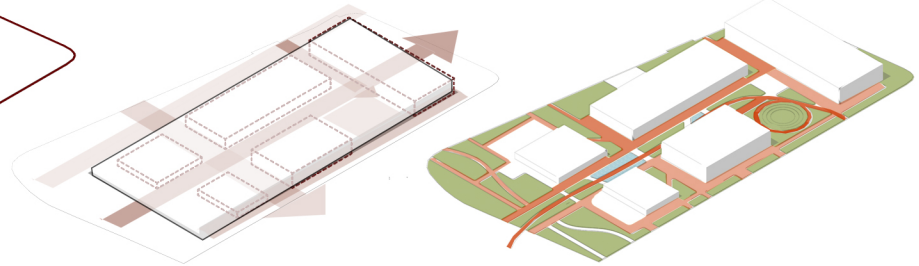
Greening the Marconi area and the surroundings of the project site to create a more natural environment and mitigate the impact of industrial noise from the nearby facilities.

Concept Diagram



Site

The site is composed of two industrial warehouses, the Baraonda Social Centre, and a car park area.



Mass

By reimagining the site, we establish primary and secondary axes that define the interplay of built volumes and open spaces.

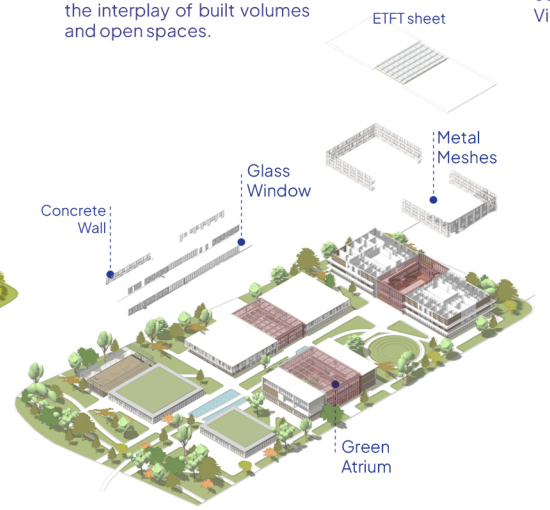
Circulation

The project site integrates directly with the Eco-Loop axis, creating a continuous green corridor that links Via Pacinotti to the Green Kilometre.



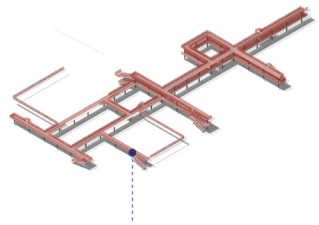
Vegetation

The project site welcomes users with a lush urban park that directly links to the Green Kilometre. Embracing the "Embrace Nature" concept, it weaves greenery through both interior and exterior axes, guiding visitors toward a central green plaza. Upon exiting the park, users seamlessly enter the Eco-Loop pathway that threads through the entire district.



Facade

The building volumes are lightened with glazed façades and warm timber elements, and all construction is supported by sustainably sourced, low-impact materials.



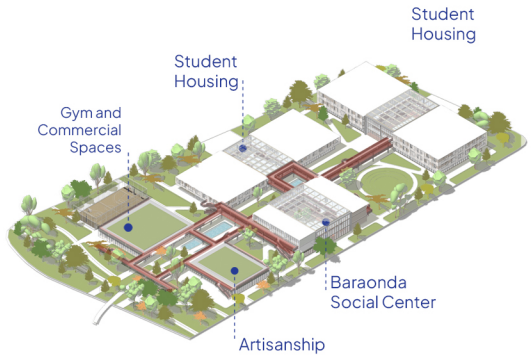
Bridges

Circulation between buildings is extended to upper levels via sky bridges, each linking through green atriums to create a continuous, seamless flow throughout the complex.

Green Infrastructure Solutions







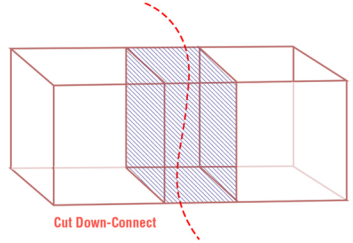
Social Community Hub

It transforms into a vibrant community hub within the industrial district—embracing greenery and uniting local residents and students through a variety of interactive, social activities.

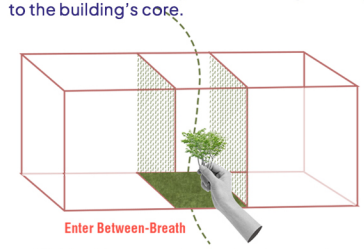
The form of Volumes



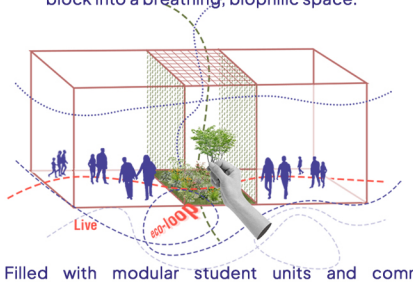
A monolithic volume establishes the envelope of existing warehouse structures—a blank canvas of industrial scale and proportion.



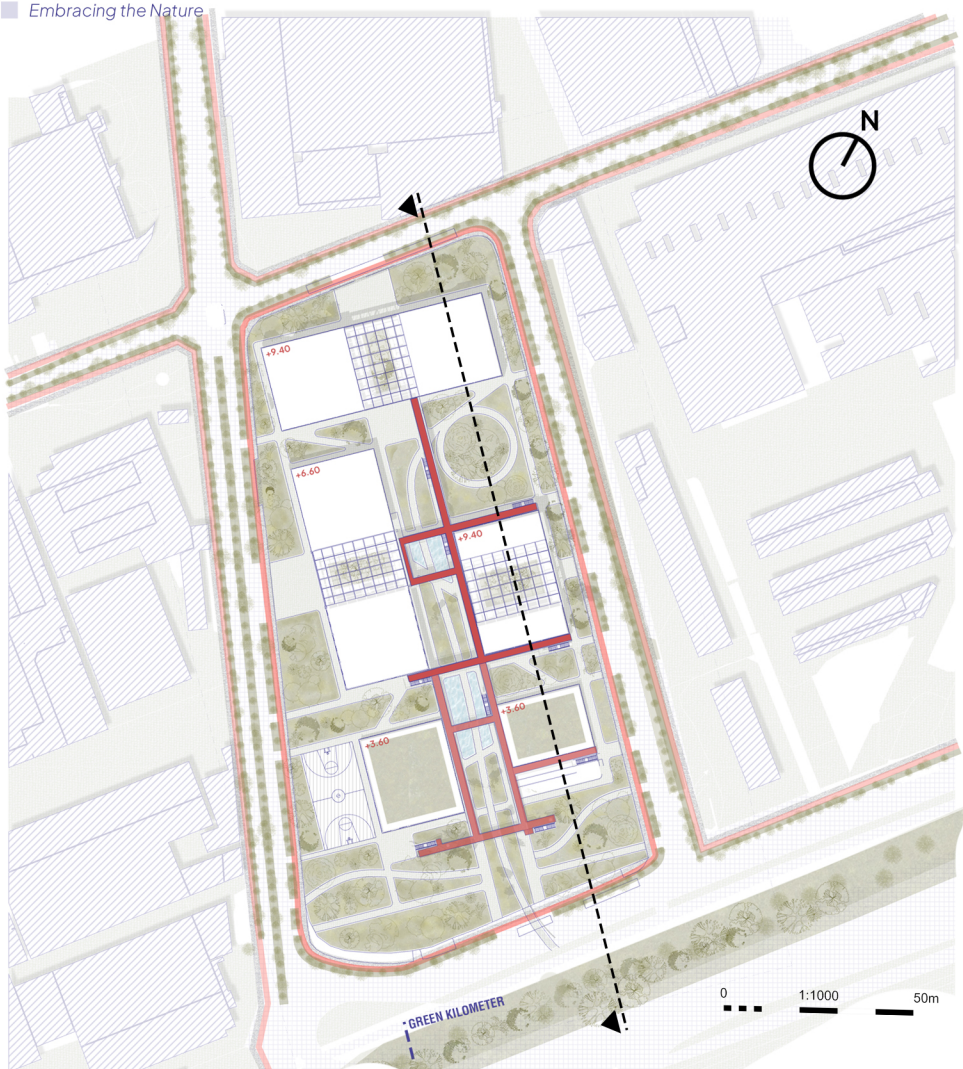
We surgically carve a vertical slit through the mass, aligning it with the Eco-Loop to physically and visually link exterior greenways to the building's core.



Within this cut, a planted atrium and open void invite daylight, natural ventilation, and informal gathering—transforming a solid block into a breathing, biophilic space.



Filled with modular student units and communal pathways, the enlivened volume pulses with life. The Eco-Loop weaves through the atrium, ensuring every resident lives within arm's reach of nature.

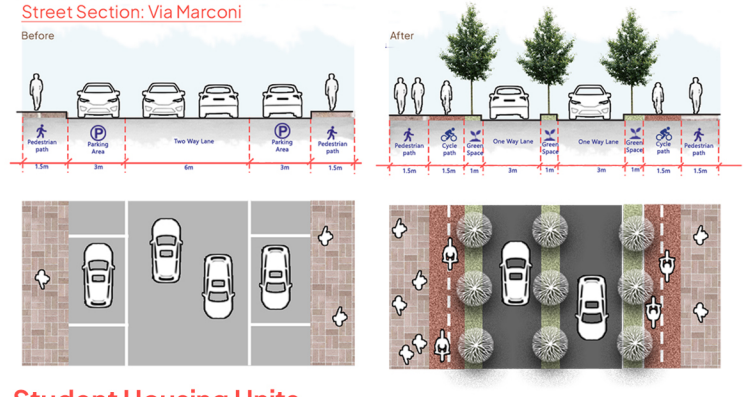


"Stitching Nature Through Industry

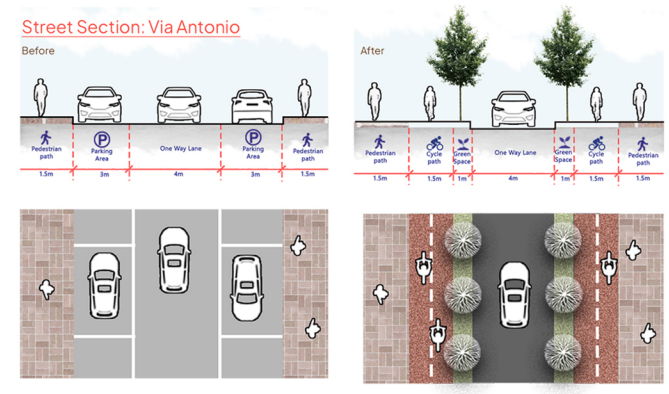
Vision

A network of circular hubs at key intersections—like Baraonda and Via Galvani—forms a curving green loop that unifies the district. This system weaves green infrastructure with adaptive reuse, transforming each building into a pocket of nature and community. The loop fosters social interaction, ecological diversity, and resilience, turning a once monofunctional area into a vibrant, student-centered tapestry.

Street Section: Via Marconi



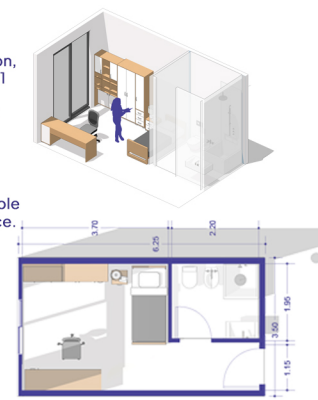
Street Section: Via Antonio



Student Housing Units

Type 1 Bedroom

The Type 1 Bedroom is a compact yet efficient option, featuring a 15.1 m² living area and a 4.32 m² bathroom — ideal for students looking for a quiet and simple personal space.



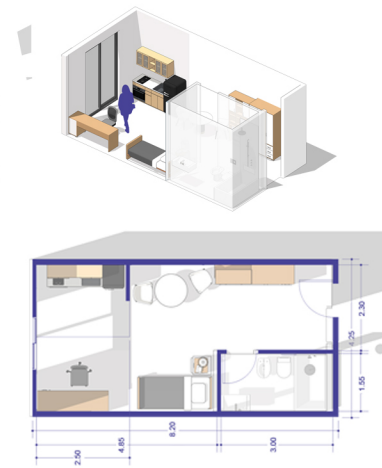
Type 2 Bedroom

The Type 2 Bedroom provides more room to live and study, with a 20.5 m² living area, a 6 m² kitchen area for basic meal preparation, and a 4.65 m² private bathroom.

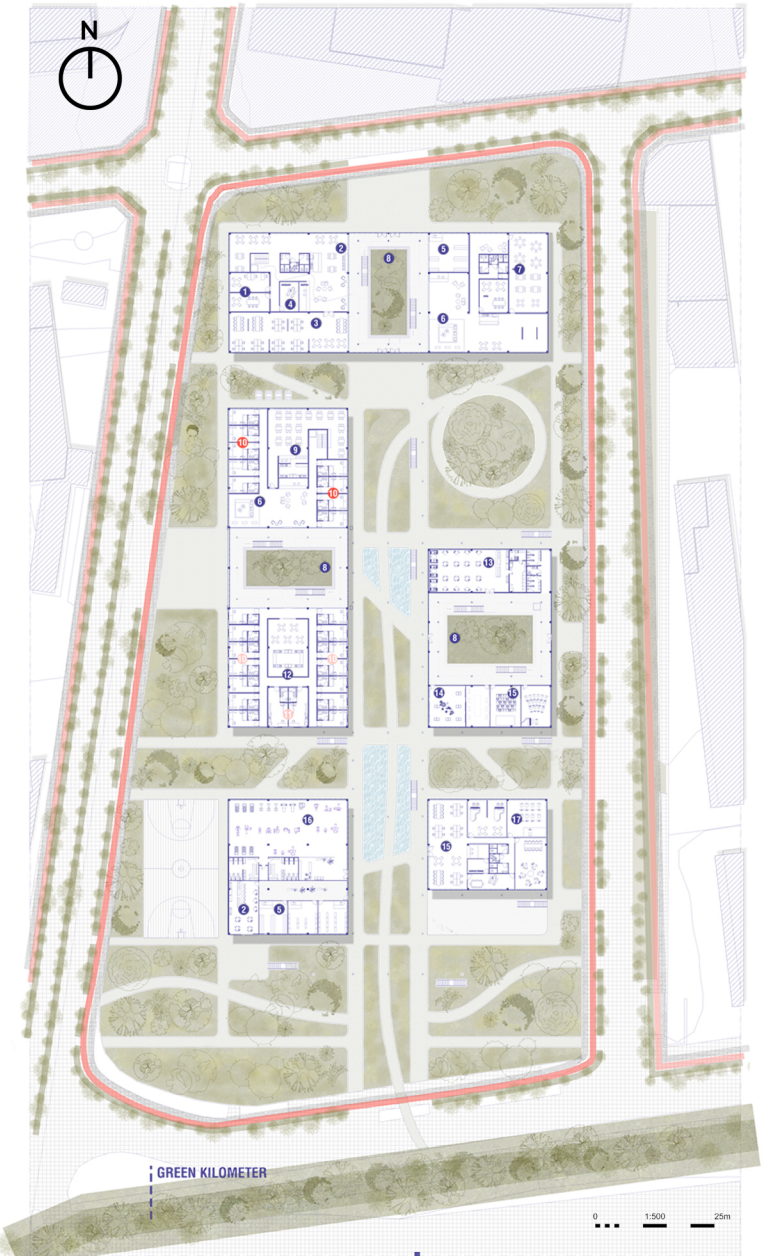


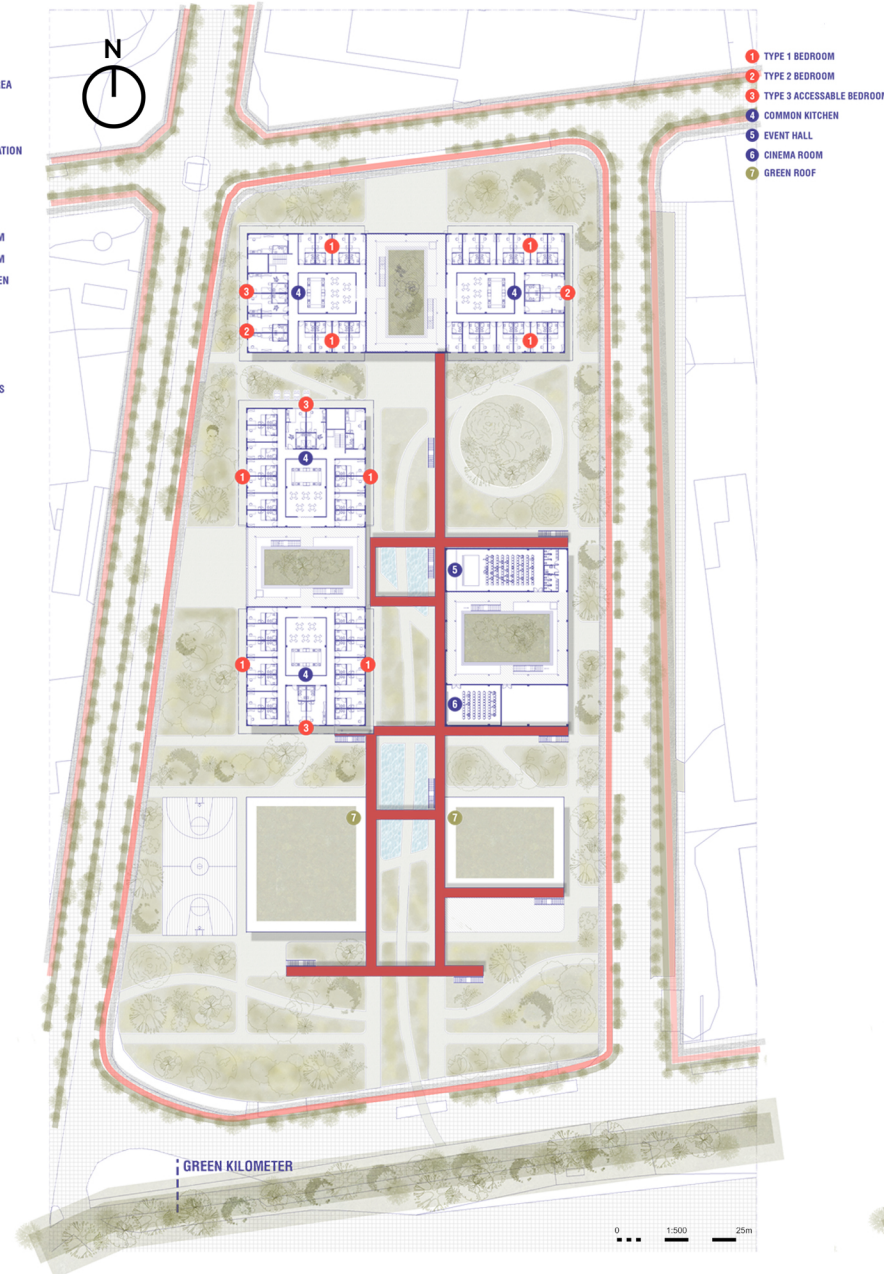
Type 3 Accessable Bedroom

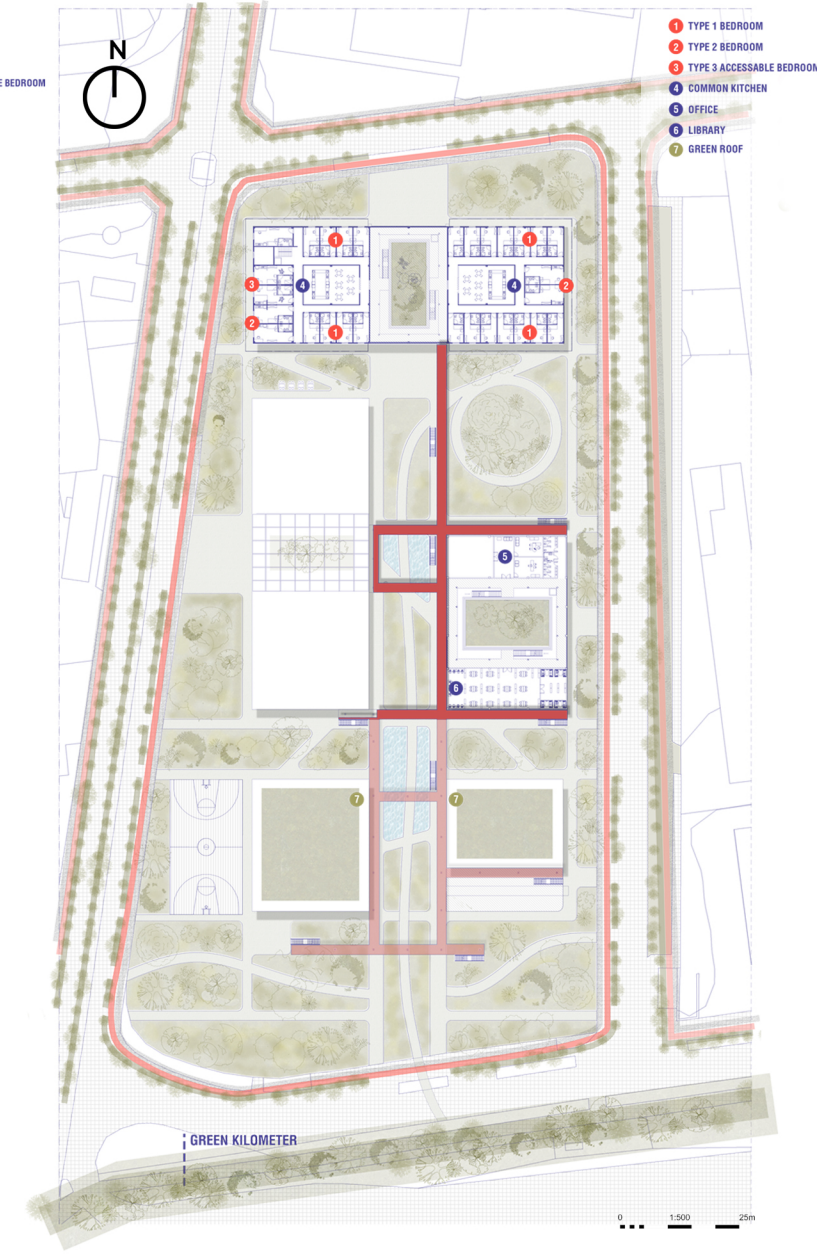
We also offer an Accessible Bedroom specifically designed for students with physical disabilities. This unit features a spacious 19.8 m² living area, a 4.7 m² accessible kitchen area, and a 6.25 m² wheelchair-friendly bathroom, ensuring maximum comfort, independence, and mobility.






N
1 OFFICE
2 CAFE
3 CO-WORKING AREA
4 MANAGEMENT
5 SHOPS
6 GREEN CARE STATION
7 EVENT AREA
8 GREEN ATRIUM
9 CAFETERIA
10 TYPE 1 BEDROOM
11 TYPE 2 BEDROOM
12 COMMON KITCHEN
13 RESTAURANT
14 EXHIBITION
15 STUDIOS
16 GYM
17 ART WORKSHOPS
GREEN KILOMETER
0 1:500 25m


N
1 TYPE 1 BEDROOM
2 TYPE 2 BEDROOM
3 TYPE 3 ACCESSABLE BEDROOM
4 COMMON KITCHEN
5 EVENT HALL
6 CINEMA ROOM
7 GREEN ROOF
GREEN KILOMETER
0 1:500 25m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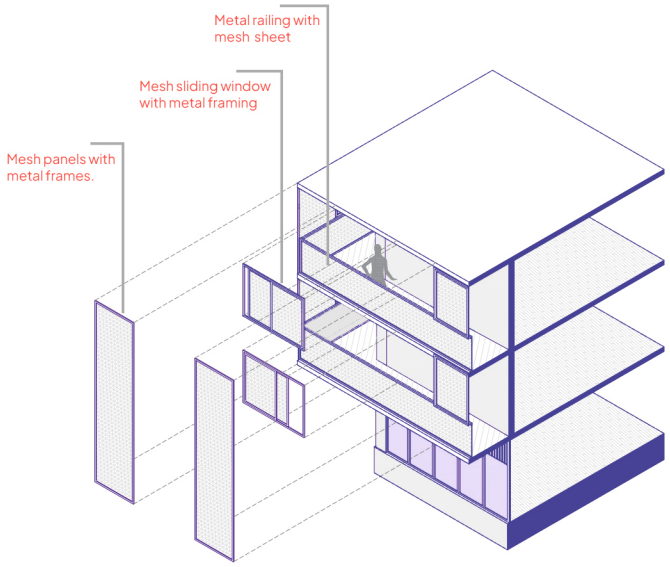
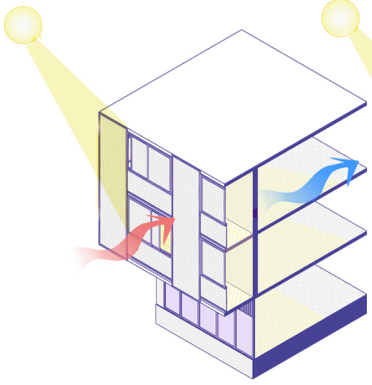
1 TYPE 1 BEDROOM
2 TYPE 2 BEDROOM
3 TYPE 3 ACCESSABLE BEDROOM
4 COMMON KITCHEN
5 OFFICE
6 LIBRARY
7 GREEN ROOF
GREEN KILOMETER
0 1:500 25m

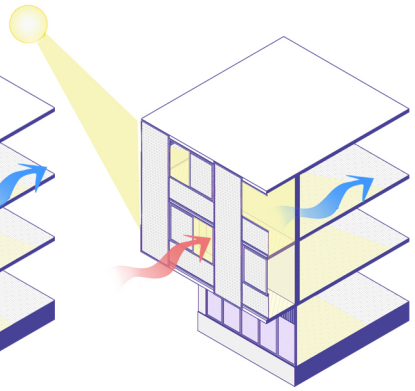


WHEN EXTERIOR PANELS ARE CLOSED



Mesh panels on the façade filter harsh sunlight, allowing only diffused light inside, reducing glare.
Incoming hot air passes through the mesh, cooling down as it circulates indoors, enhancing thermal comfort.

WHEN EXTERIOR PANELS ARE OPEN



Openings allow more direct sunlight to enter, increasing internal heat and glare.
Despite this, the mesh still helps cool incoming air before it circulates inside the building.

Perspective view



Green Square



A view towards student housing



A view towards new baraonda social center

