



MACALLAN

SAINT-GOBAIN STUDENT CONTEST 2025

MIGUEL HERRERO

IKER DÍAZ

MARCOS HERNÁNDEZ

SPAIN

ETSA VALLADOLID



MIGUEL HERRERO SUGASAGA



IKER DÍAZ GONZÁLEZ



MARCOS HERNÁNDEZ SANTOS

1- SITE ANALYSIS

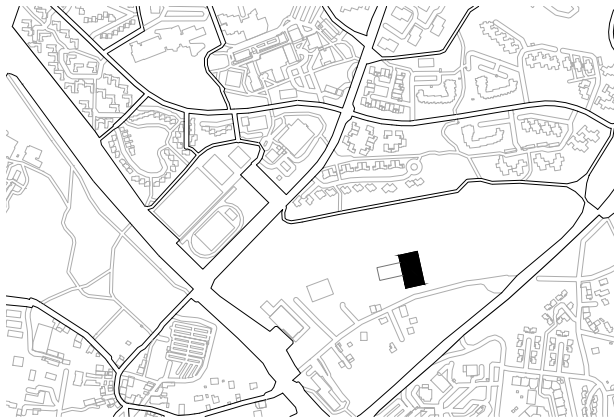
2- PROJECT DETAILS

3- BIOCLIMATIC STRATEGIES & TECHNICS

1 | SITE ANALYSIS



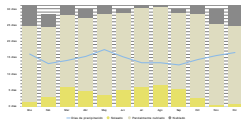
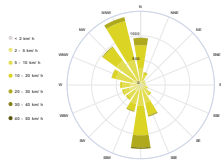
SITUATION



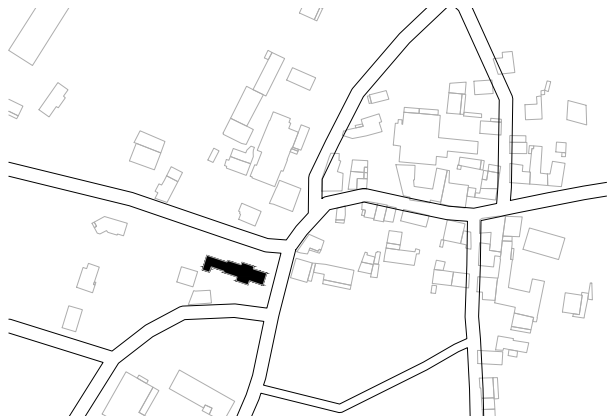
VILLEFONTAINE, LYON

Located in Villafontaine, next to Les Grands Ateliers, this building is an opportunity to innovate and create a space adaptable to both the present and the future, fostering creativity and the exchange of knowledge.

BUILDING A NEW CONSTRUCTION



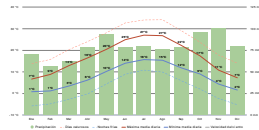
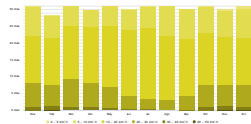
SITUATION



CHIMILIN, LYON

A few kilometers away, in Chimilin, the challenge is different: transforming an old school into a renewed space, adapted to new functions and needs.

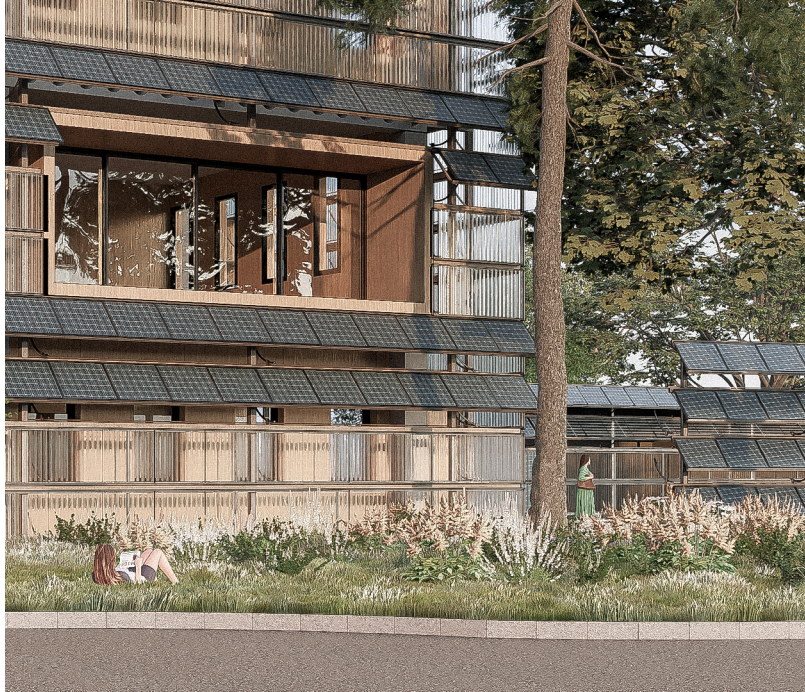
BUILDING B REHABILITATION

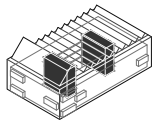


2 | PROJECT DETAILS

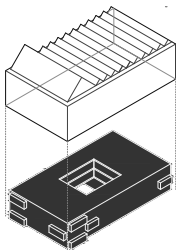


BUILDING A | NEW
CONSTRUCTION

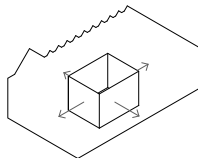




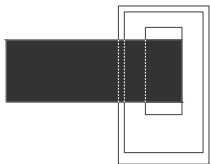
INTERPLAY OF SOLIDS AND VOIDS



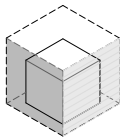
TRANSLUCENT SKIN



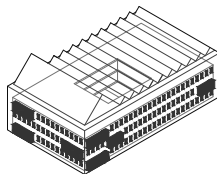
ATRIUM AS A SPACE ORGANIZER



PROTOTYPE VILLAGE

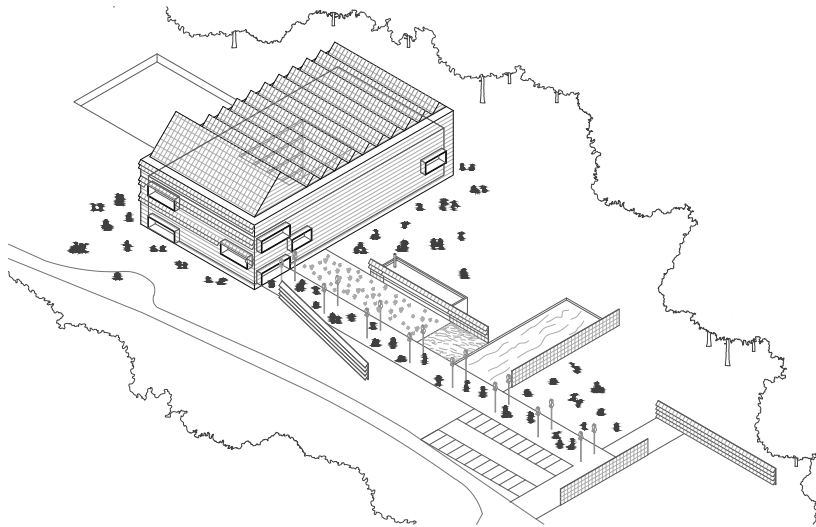


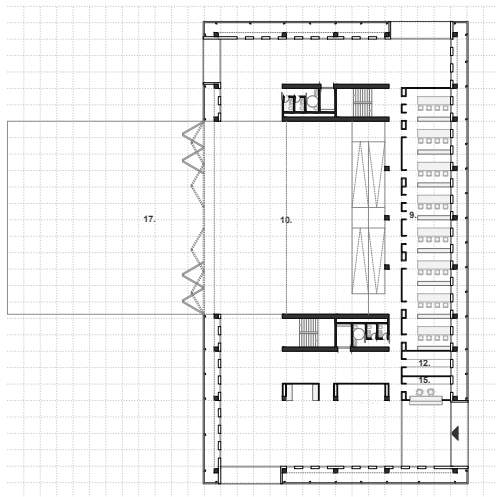
FACADE DIFFERENTIATION BY ORIENTATION



OPENINGS

AXONOMETRIC VIEW



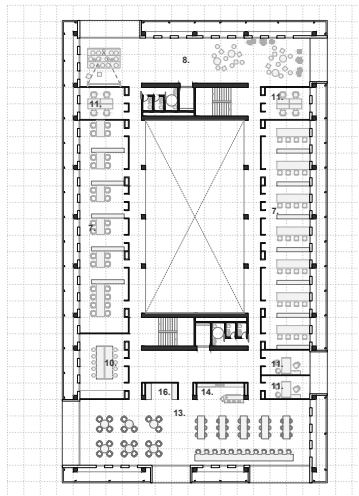


ACCOMMODATION

1. Accessible single bedroom
2. Eight people bedroom
3. Six people bedroom
4. Single bedroom
5. Double bedroom
6. Bathroom

CO-CREATION LABORATORY

7. Office space
8. Multi-use room
9. Laboratory
10. Prototype area
11. Meeting room
12. Wardrobe
13. Staff restroom
14. Kitchen
15. Reception
16. Machine room
17. Prototype village

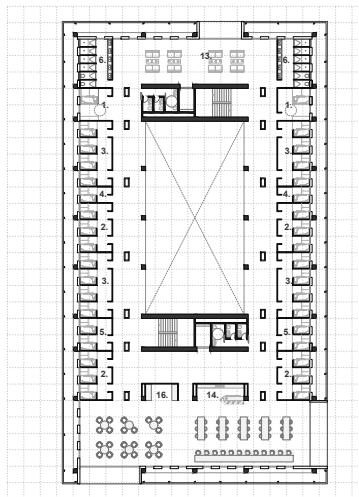


ACCOMMODATION

1. Accessible single bedroom
2. Eight people bedroom
3. Six people bedroom
4. Single bedroom
5. Double bedroom
6. Bathroom

CO-CREATION LABORATORY

7. Office space
8. Multi-use room
9. Laboratory
10. Prototype area
11. Meeting room
12. Wardrobe
13. Staff restroom
14. Kitchen
15. Reception
16. Machine room
17. Prototype village



ACCOMMODATION

1. Accessible single bedroom
2. Eight people bedroom
3. Six people bedroom
4. Single bedroom
5. Double bedroom
6. Bathroom

CO-CREATION LABORATORY

7. Office space
8. Multi-use room
9. Laboratory
10. Prototype area
11. Meeting room
12. Wardrobe
13. Staff restroom
14. Kitchen
15. Reception
16. Machine room
17. Prototype village

SECTIONS



BUILDING A
NEW CONSTRUCTION



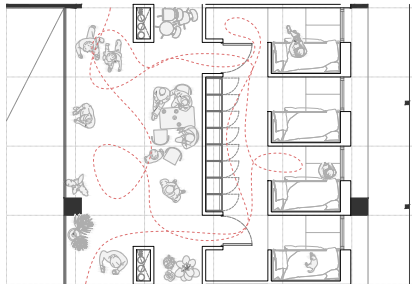
VIEWS



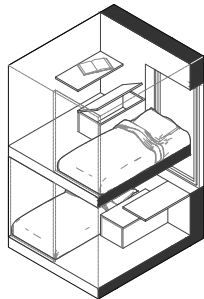
BUILDING A
NEW CONSTRUCTION



ROOMS

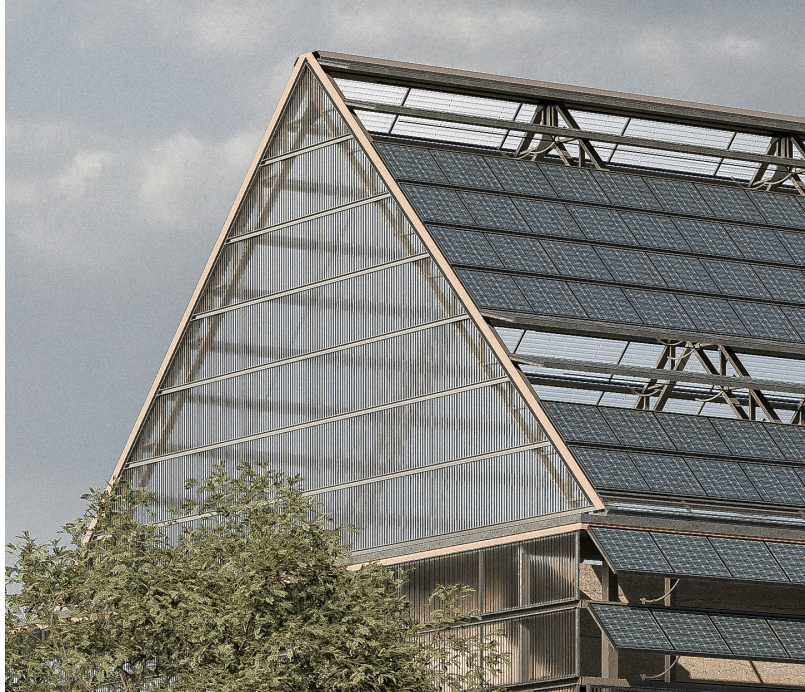


BUILDING A NEW CONSTRUCTION

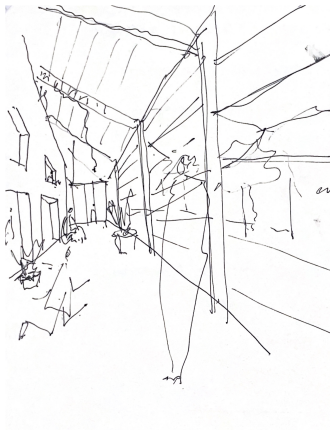


The housing units are arranged around a **common corridor**. Inside, collective rooms are proposed **without compromising private space**, allowing residents to have their own workspace and living area.

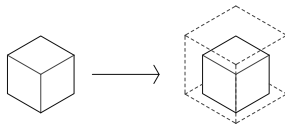
**BUILDING B |
REHABILITATION**



CONCEPTS

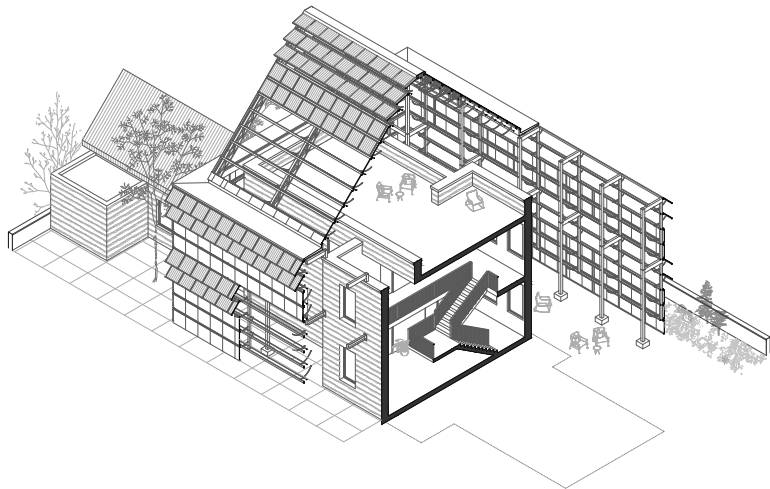


NEW SPACES



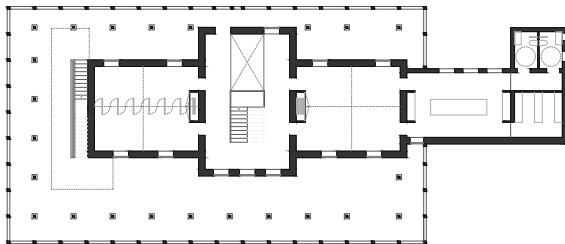
EXISTING BUILDING ENCLOSURE

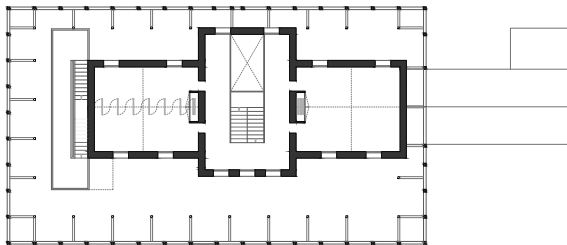
AXONOMETRIC VIEW



BUILDING B
REHABILITATION









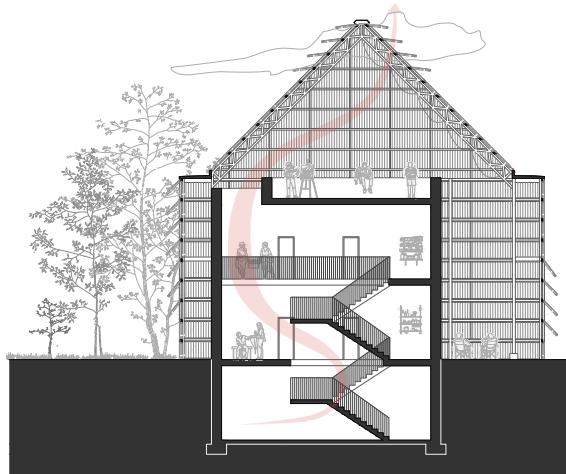
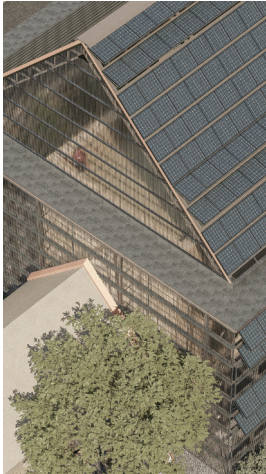
By covering the existing building in Chimilin, we create a series of new **transition spaces** between the interior and exterior. Similarly, we make the roof accessible for use, creating **new social spaces**. This new system could function independently from the building's interior use.



By covering the existing building in Chimilín, we create a series of new **transition spaces** between the interior and exterior. Similarly, we make the roof accessible for use, creating **new social spaces**. This new system could function independently from the building's interior use.

SECTIONS

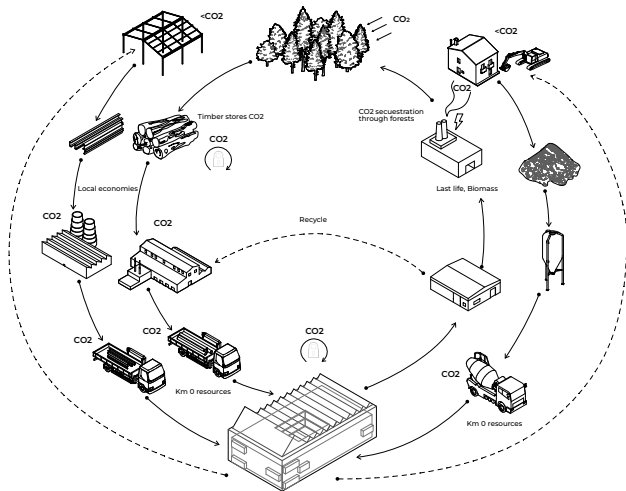
BUILDING B REHABILITATION

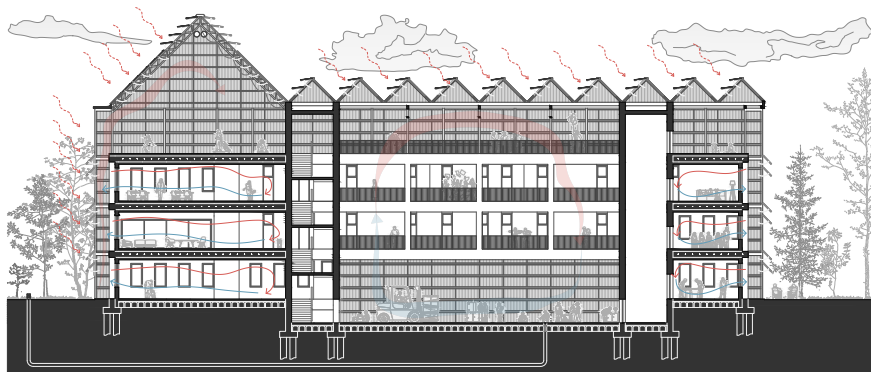


The Chimillin building uses the same **translucent second skin** system as the Villafontaine building. This system ensures that both buildings share a **similar bioclimatic approach**.

3 | BIOCLIMATIC STRATEGIES & TECHNICS







In winter, the translucent skin allows solar radiation to pass through, passively heating the building like a Trombe wall.



In summer, the atrium acts like a solar chimney, cooling the building.



The building optimizes thermal comfort and efficiency with a Canadian well, which naturally regulates air temperature.

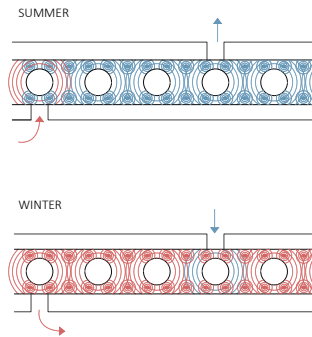


The building optimizes thermal comfort and efficiency with a Canadian well, which naturally regulates air temperature.



The translucent roof harnesses sunlight and adjusts its opacity for better light control.

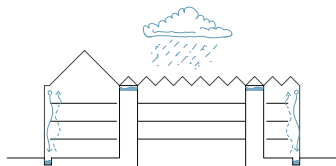
THERMAL MASS SLAB



3 | BIOCLIMATIC STRATEGIES



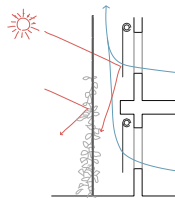
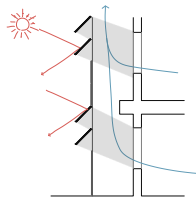
RAINWATER RECYCLING



3 | BIOCLIMATIC STRATEGIES

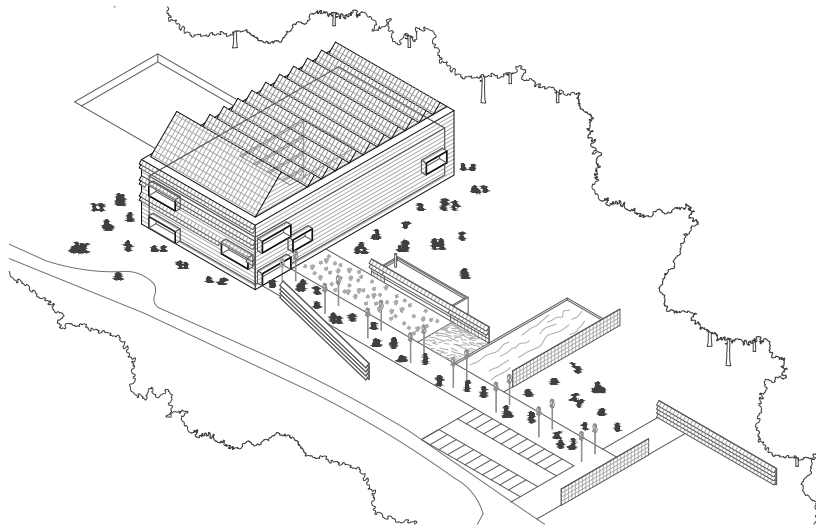


SUN CONTROL



3 | BIOCLIMATIC STRATEGIES





BIOMASS



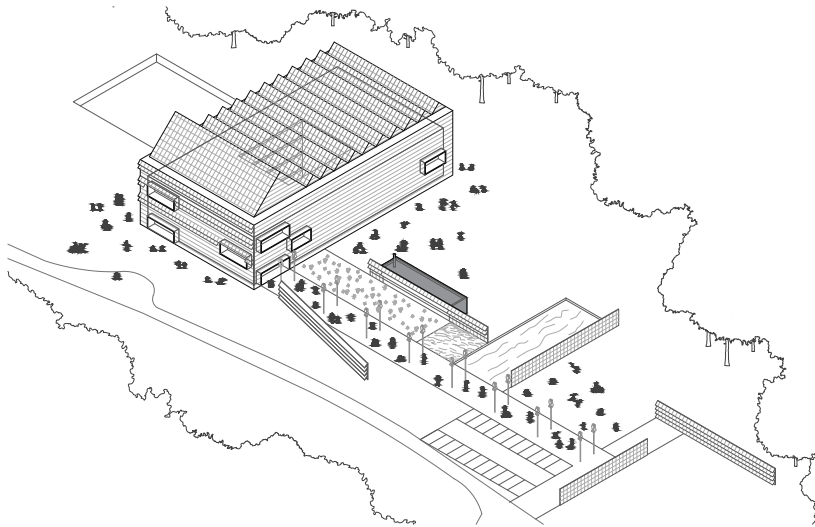
PHYTOREMEDIATION



WIND

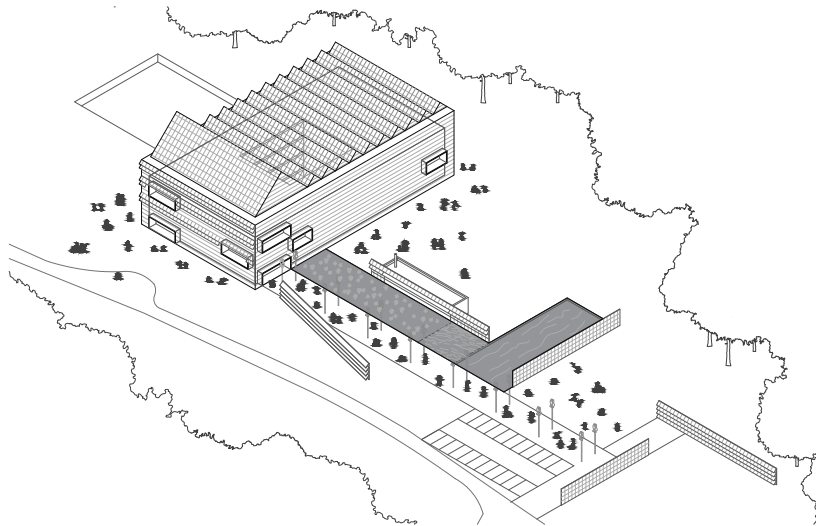


SOLAR

**BIOMASS**

The biomass used comes from wood waste from Les Grands Ateliers, transformed into energy. This system reduces material waste and improves the building's thermal efficiency, ensuring a more sustainable operation

**PHYTOREMEDIATION****WIND****SOLAR**



BIOMASS



PHYTOREMEDIATION

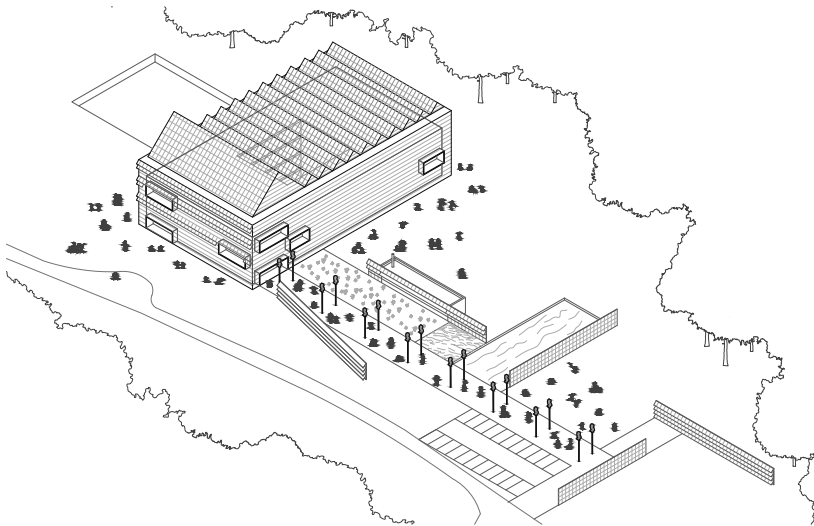
Grey water is treated in ponds through phytoremediation, where plants and microorganisms naturally filter and degrade contaminants. This improves water quality, allowing for its reuse or discharge with no significant environmental impact.



WIND



SOLAR



BIOMASS



PHYTOREMEDIATION

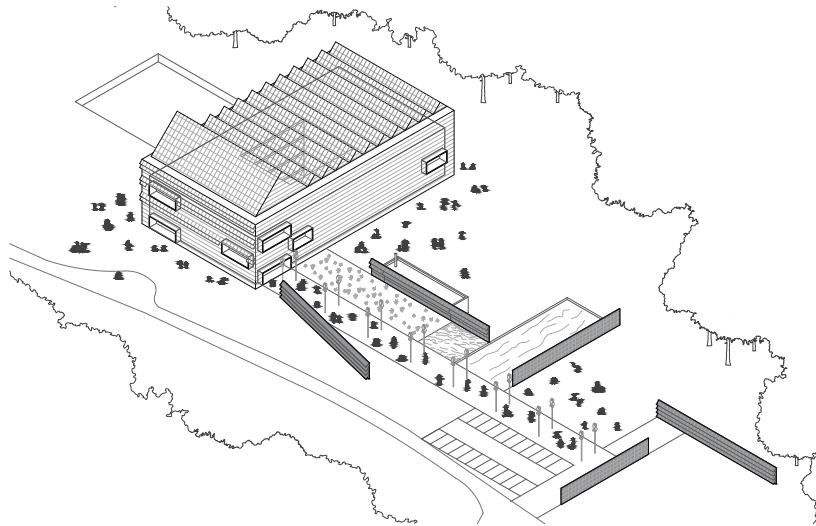


WIND

A series of wind turbines have been installed along the access road to the building, with the purpose of capturing wind energy and **STORING** it for use in future energy demands.



SOLAR



BIOMASS



PHYTOREMEDIATION



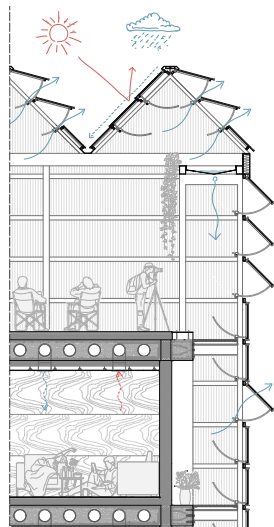
WIND



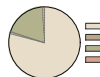
SOLAR

Solar capture is optimized with south-facing photovoltaic panels, integrated into the building to generate shade and reduce heating. Additionally, panels are distributed across the plot to maximize energy collection, which is stored and managed efficiently, reducing consumption and promoting sustainability.

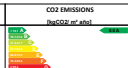
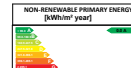
CONSTRUCTION & TECHNICAL APPROACH



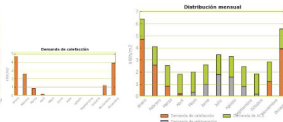
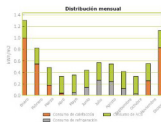
Life Cycle



Energy class



Energy Consumption Tables



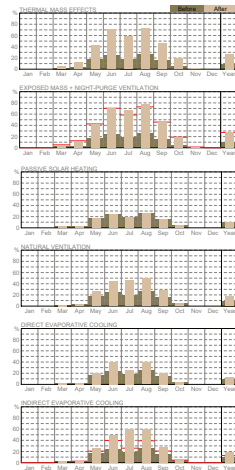
Opaque constructions

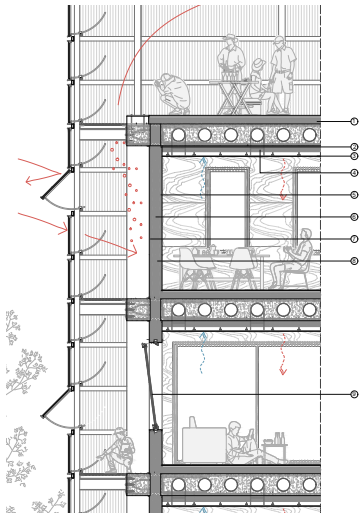
Name	Superficie [m²]	U [W/m²·K]
Cubierta con aire	987.0	0.12
Fachada sur	274.5	0.10
Fachada norte	285.0	0.10
Fachada este	594.0	0.10
Fachada oeste	555.0	0.10
Suelo con terreno	960.0	0.19

Windows

Name	Superficie [m²]	U [W/m²·K]	Factor solar
Ventana este	65.1	0.68	0.20
Ventana oeste	105.0	0.68	0.01
Ventana sur	73.5	0.68	0.02
Ventana norte	63.0	0.68	0.35

3 | TECHNICAL APPROACH





- 2. PLACO® RAIL PLANET FUTURE 70
- 3. RIGITONE® EDGE 12/25 Q Activ'Air®
- 5. PLACO® BA 15 1200
- 7. PLACO® PPM 15 1200
- 8. PLACO® STUD PLANET FUTURE 70



- 1. ACUTEX, HIGH-DENSITY RIGID MINERAL WOOL PANEL
- 4. ECOSLAB, MINERAL WOOL PANEL
- 6. GEOWALL35, MINERAL WOOL PANEL



- 9. COOL-LITE® XTREME

Monthly energy output from fix-angle PV system:



Monthly in-plane irradiation for fixed-angle:

