



ARCHITECTURE STUDENT CONTEST

18th INTERNATIONAL EDITION, LISBON 2023

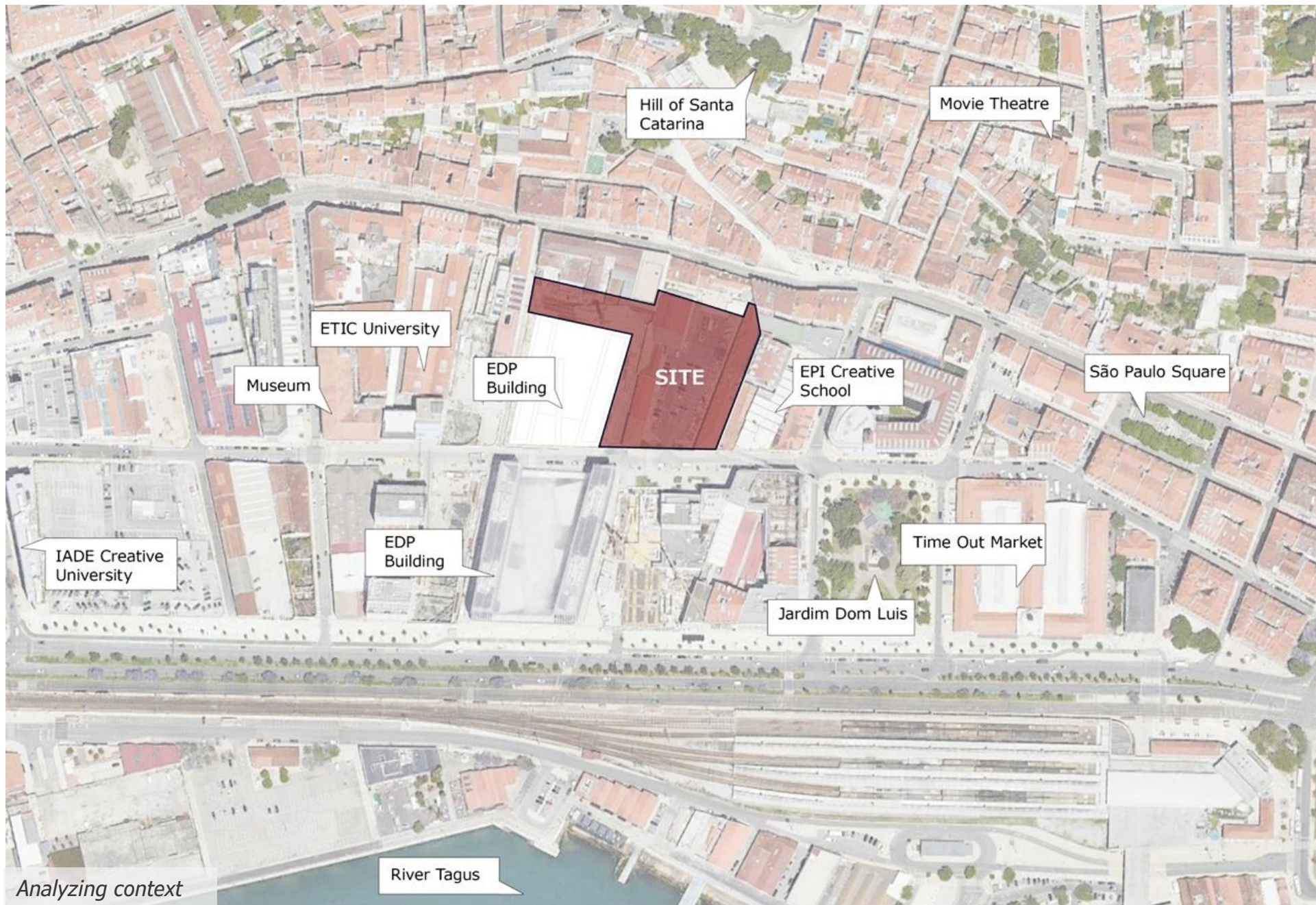
EcoHub : A place in the heart of Nature

Presentation No.	24
Country	India
University	Sushant University
Student	Shruti Bansal



EcoHub

A place in the heart of Nature



Located close to the Tagus river, the site is a part of the East Boavista Landfill.

The site is surrounded by creative schools such as the; IADE university, Fine arts school and ETIC school giving it a strong cultural and art identity.

Due to rapid urbanization and change in the built fabric, the aim is improving the functional profile, decreasing the loss of activity in the region.



RIVER

River Tagus is an important part of the identity of the people of Lisbon.



NATURE

Nature and vegetation is predominant atop the hills, in parks and gardens.



SOCIAL

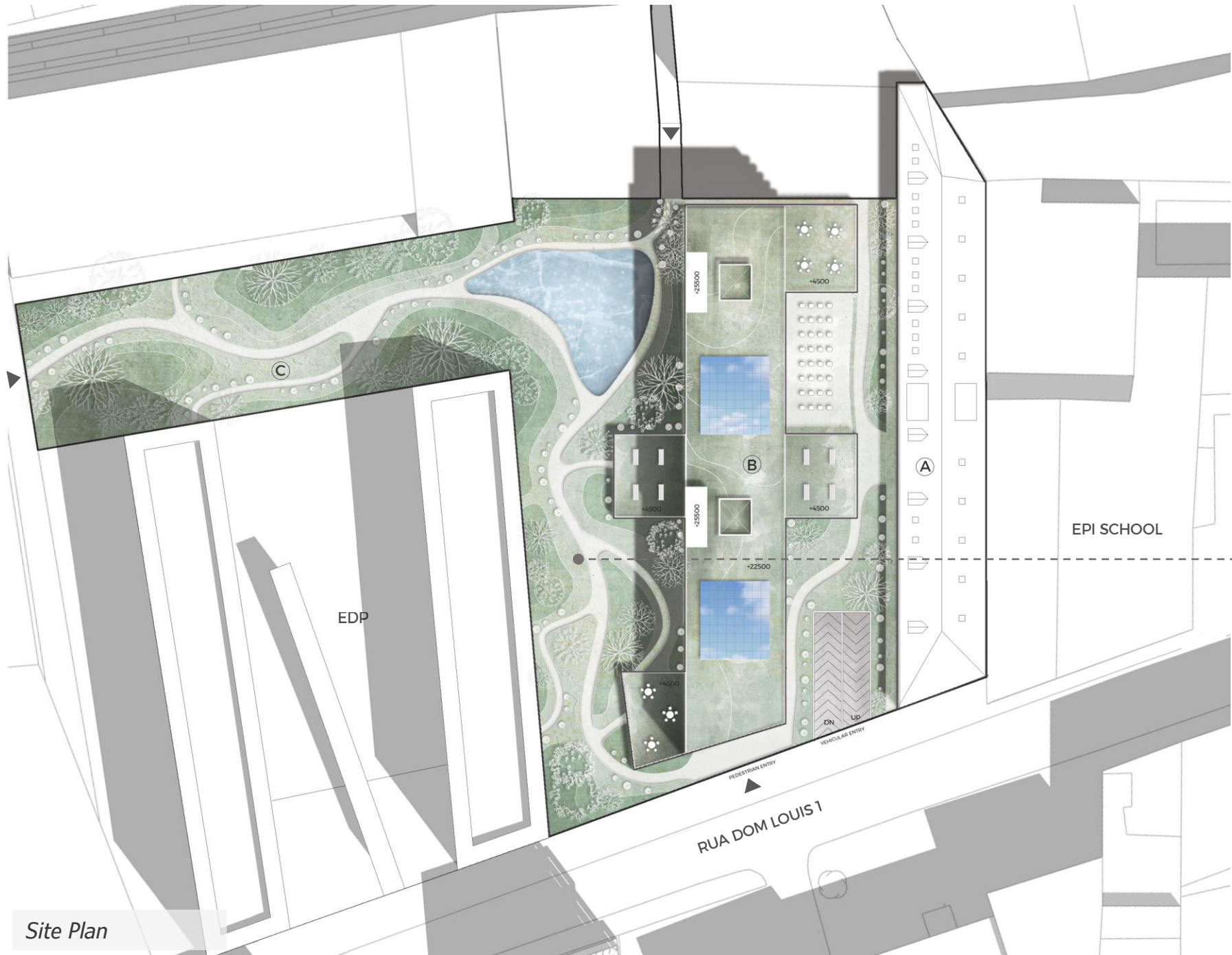
People in Lisbon like socializing and interacting, that reflects in its architecture.



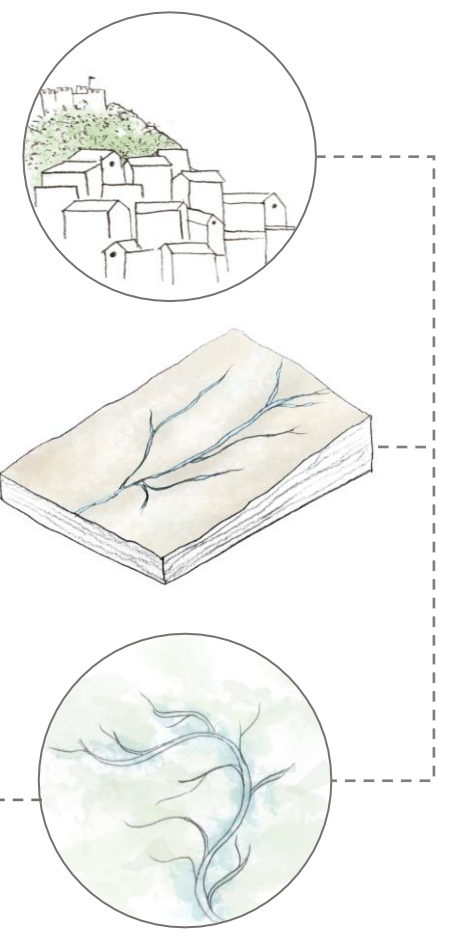
The project aims to act as an extension of the green hills, while opening up for pedestrian circulation and enjoyment.

The project, blurs the boundaries between in and out and providing its various social activity spaces with the focus on harmonizing the built with the nature.





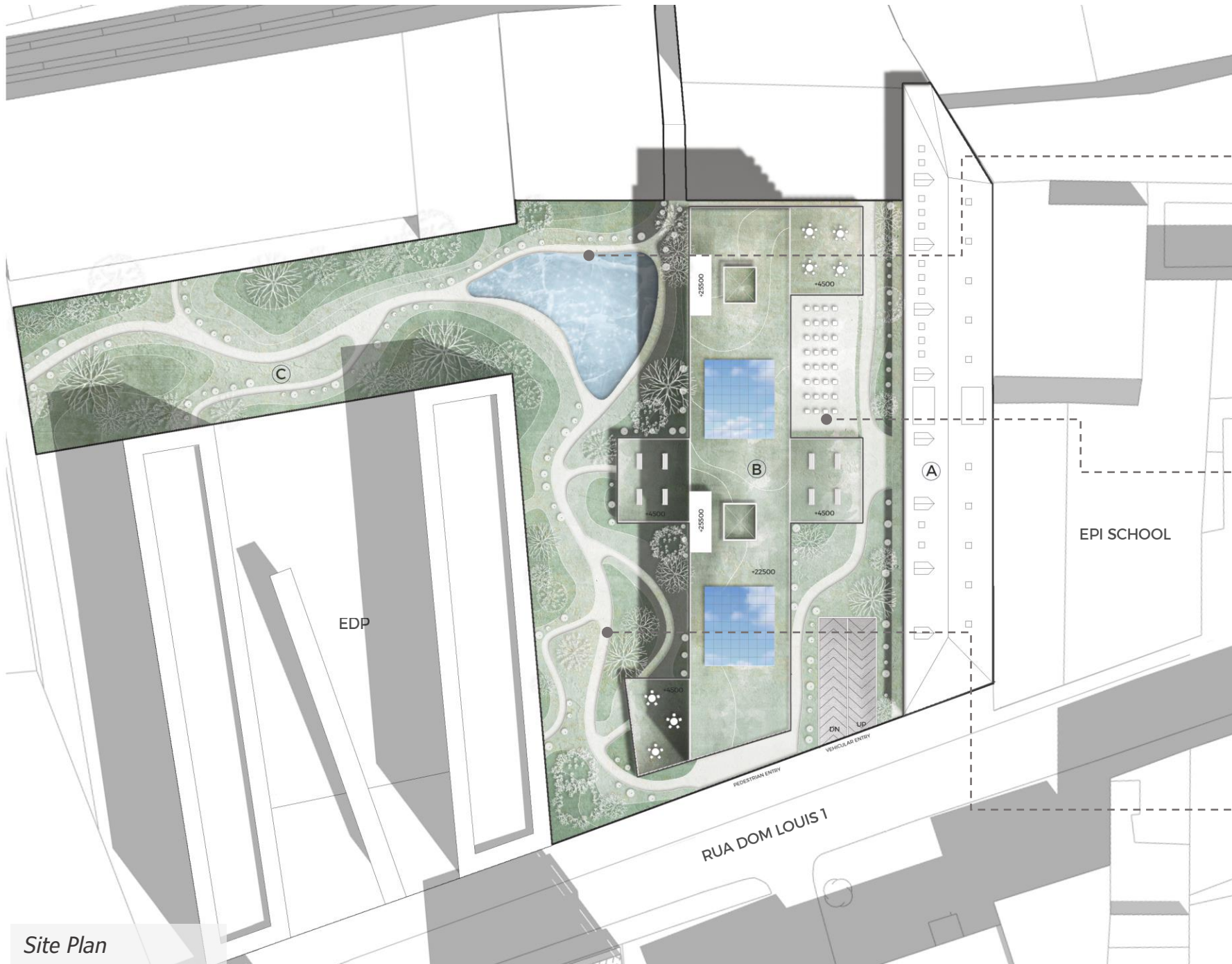
Site Plan



The external landscape C is inspired from the meandering movement of the river.

By creating routes for pedestrian circulation, increasing interconnection between the buildings and the surrounding streets.

Adding dynamicity and offering multiple paths & possibilities.



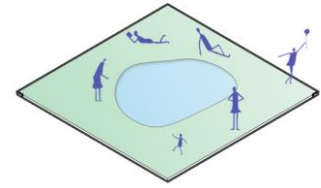
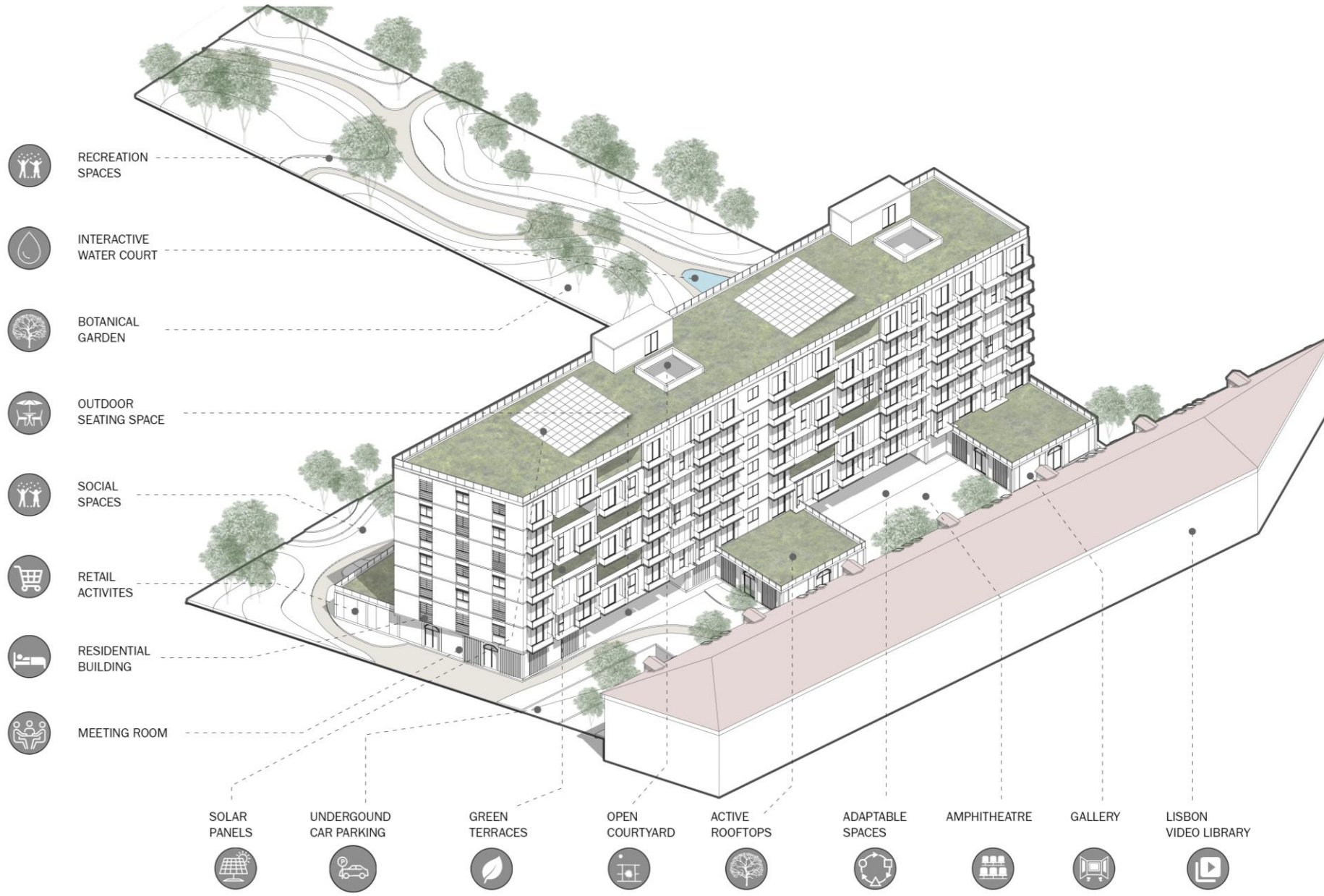
Relax and observe



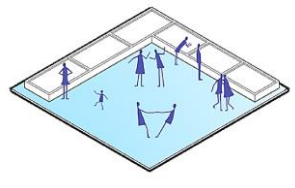
Engage and Socialize



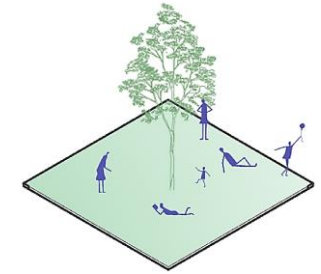
Recreation Space



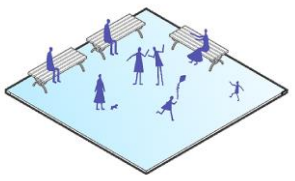
Water court



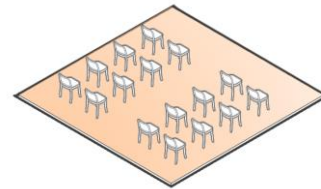
Public Plazas



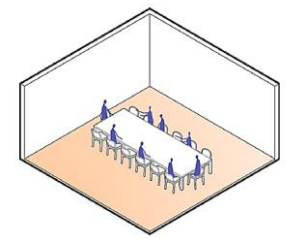
Garden Pockets



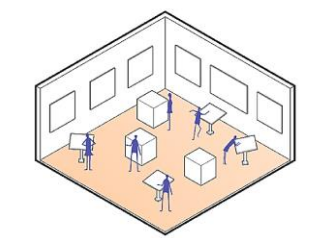
Outdoor Seating Space



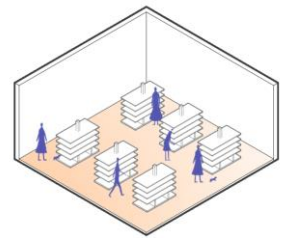
Amphitheatre



Meeting Rooms



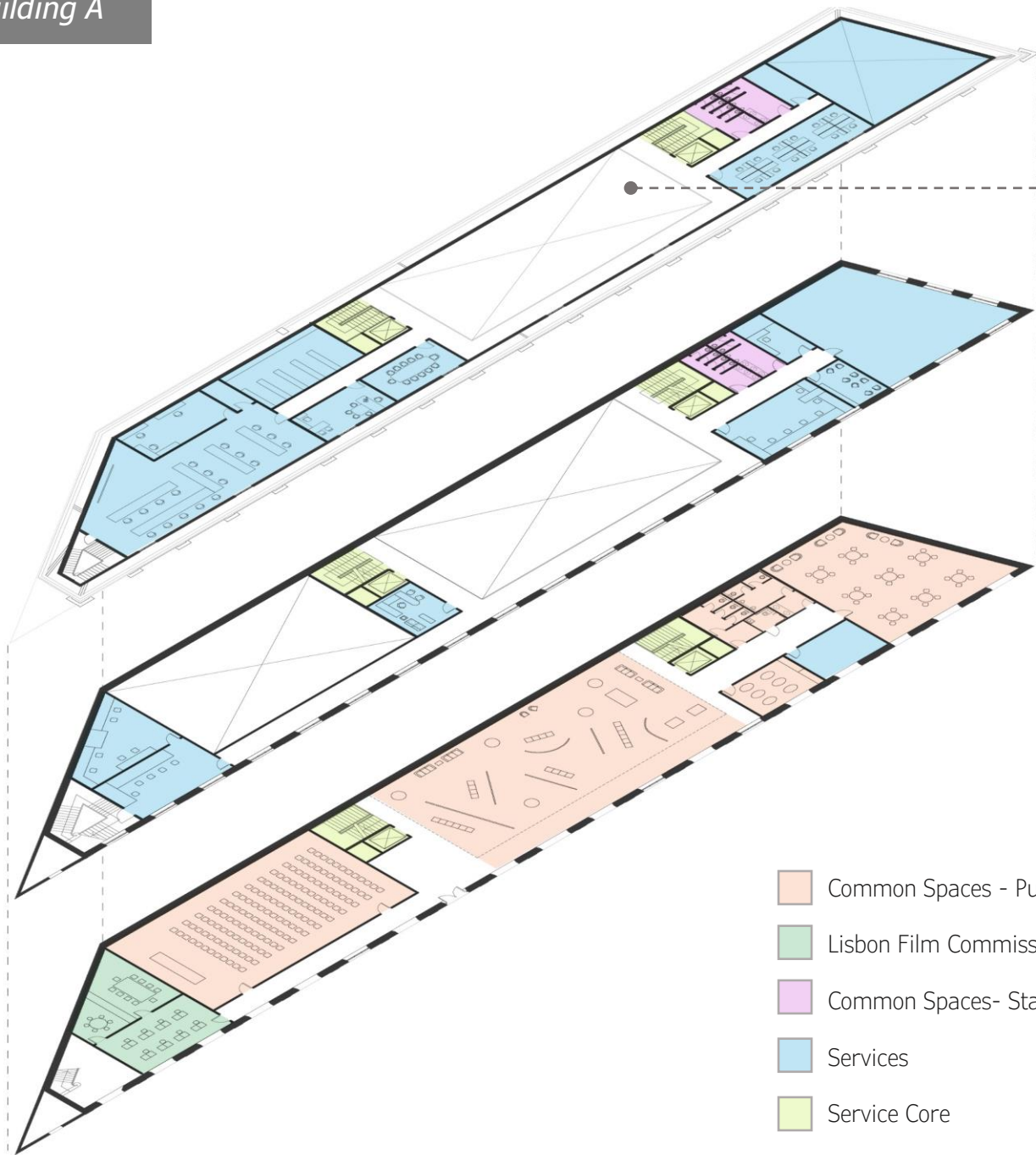
Gallery



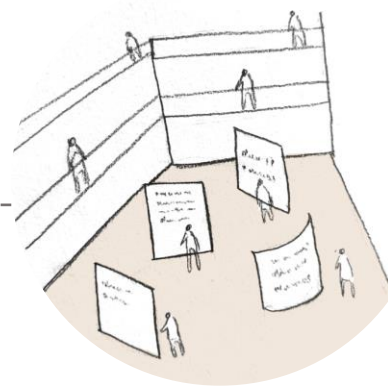
Retail Shops



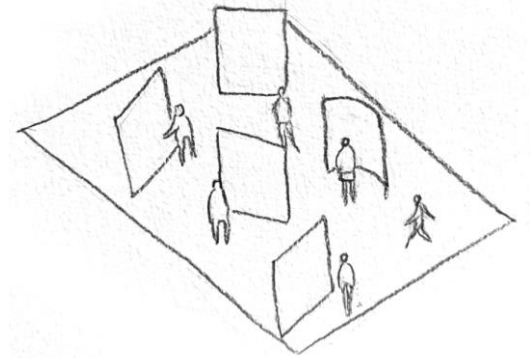
Soothing Water Court



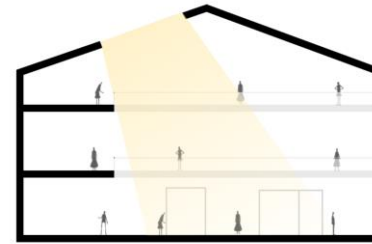
- Common Spaces - Public
- Lisbon Film Commission Area
- Common Spaces- Staff
- Services
- Service Core



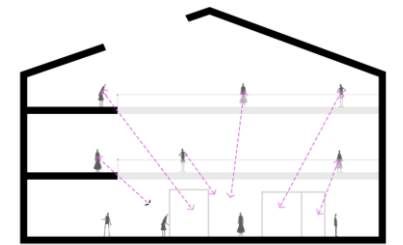
Triple Storey Exhibition Space



Generate curiosity and intrigue



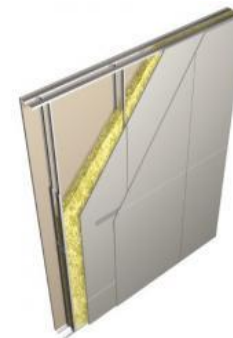
Allowing natural daylight to enter, illuminating the interiors.



Providing visual connectivity amongst the various levels.

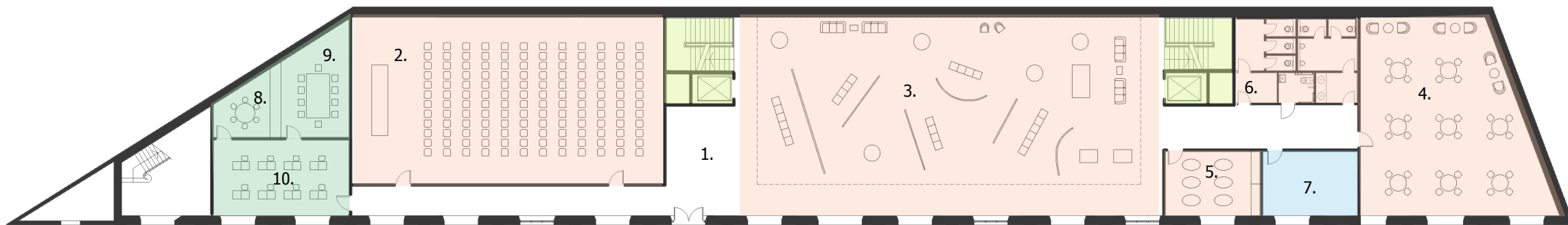


GypWall AUDIO SYSTEM
Acoustic Partition Wall
Rw= 73 dB



- Lightweight, non-loadbearing, twin frame high performance wall system
- Exceptionally high levels of sound insulation.
- Used to separate auditory, exhibition room, sound and video rooms.

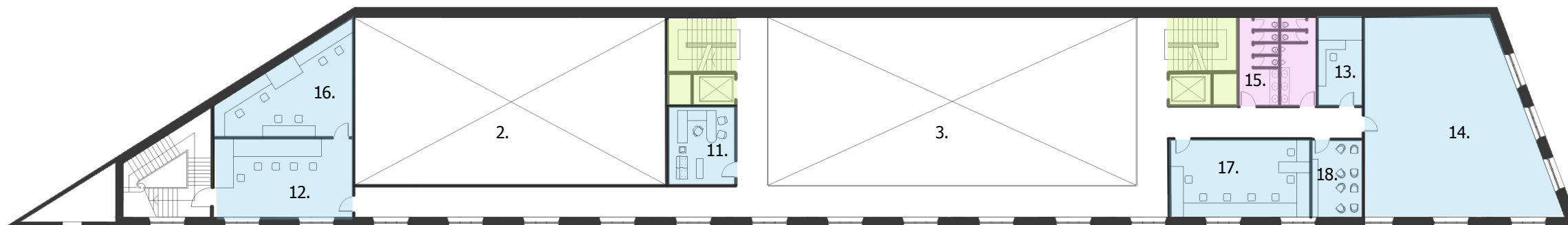




GROUND FLOOR PLAN

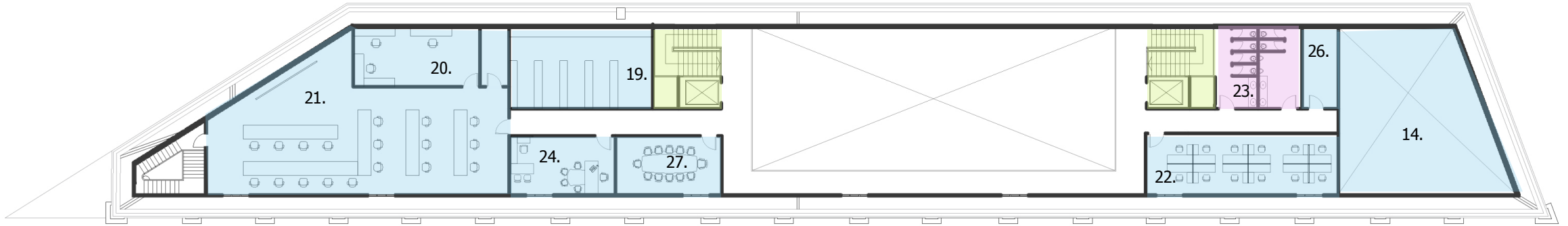
1. Reception 2. Auditorium for 140 persons 3. Exhibition Room 4. Cafeteria 5. Shop 6. Public bathroom 7. Filming equipment storage room 8. Coordinator room 9. Meeting room 10. Working room

Common Spaces - Public
 Lisbon Film Commission Area
 Common Spaces- Staff
 Services
 Service Core



FIRST FLOOR PLAN

11. Secretary and administration support room 12. Video edition room 13. Sound studio 14. TV/Cyclorama studio 15. Worker's bathroom 16. Film and video description room 17. Video digitalization room 18. Reading space



SECOND FLOOR PLAN

19. Deposit and archive room 20. Individual visioning room 21. Collective visioning room 22. Executive project production room 23. Worker's bathroom 24. Coordinator room 25. Workers eating/ pantry area
26. Networks Servers and Backstage room 27. Meeting room

Common Spaces - Public
 Lisbon Film Commission Area
 Common Spaces- Staff
 Services
 Service Core



ELEVATION



Lisbon, the capital city of Portugal, has a fascinating history that spans over many centuries. Here are some key highlights.

Early Settlement: Lisbon has a long history dating back to pre-Roman times when it was originally inhabited by Phoenicians around 1200 BC. It was the first city in the world to be named "Olisipona."

Age of Discovery: Lisbon played a crucial role in the exploration and expansion of Portuguese influence around the world. Explorers like Vasco da Gama and Bartolomeu Dias set sail from Lisbon, establishing trade routes and colonies across Africa, Asia, and the Americas.



Padrão dos Descobrimentos (Monument to the Discoveries) is a monument on the banks of the Tagus river estuary, in the district of Santa Maria de Belém, Lisbon.

Located along the river where the Portuguese sailed to explore and trade with the East, the monument celebrates the Portuguese Age of Discovery (or "Age of Exploration") during the 15th and 16th centuries.



Terreiro do Paço (Palace Yard) is a square in the heart of Lisbon, Portugal, located in the district of Baixa Pombalina.

It is one of the largest squares in Portugal, with an area of 175 by 175 meters (574 by 574 ft), that is, 30,600 square meters (329,000 ft²).



The **Praça do Comércio** (Commerce Square) is a harbour-facing plaza in the heart of Lisbon, Portugal's capital.

Lisbon, and is one of the largest squares in Portugal, with an area of 175 by 175 meters (574 by 574 ft), that is, 30,600 square meters (329,000 ft²).

Facing the Tagus (Tejo) to the South, the square is still commonly known in Portuguese as **Terreiro do Paço** (Palace Yard), as it hosted the Terreiro do Paço da Ribeira until the latter was destroyed by the great 1755 Lisbon earthquake (the subway station located there is still named after the old name of the plaza).

Exhibition Space (at morning)

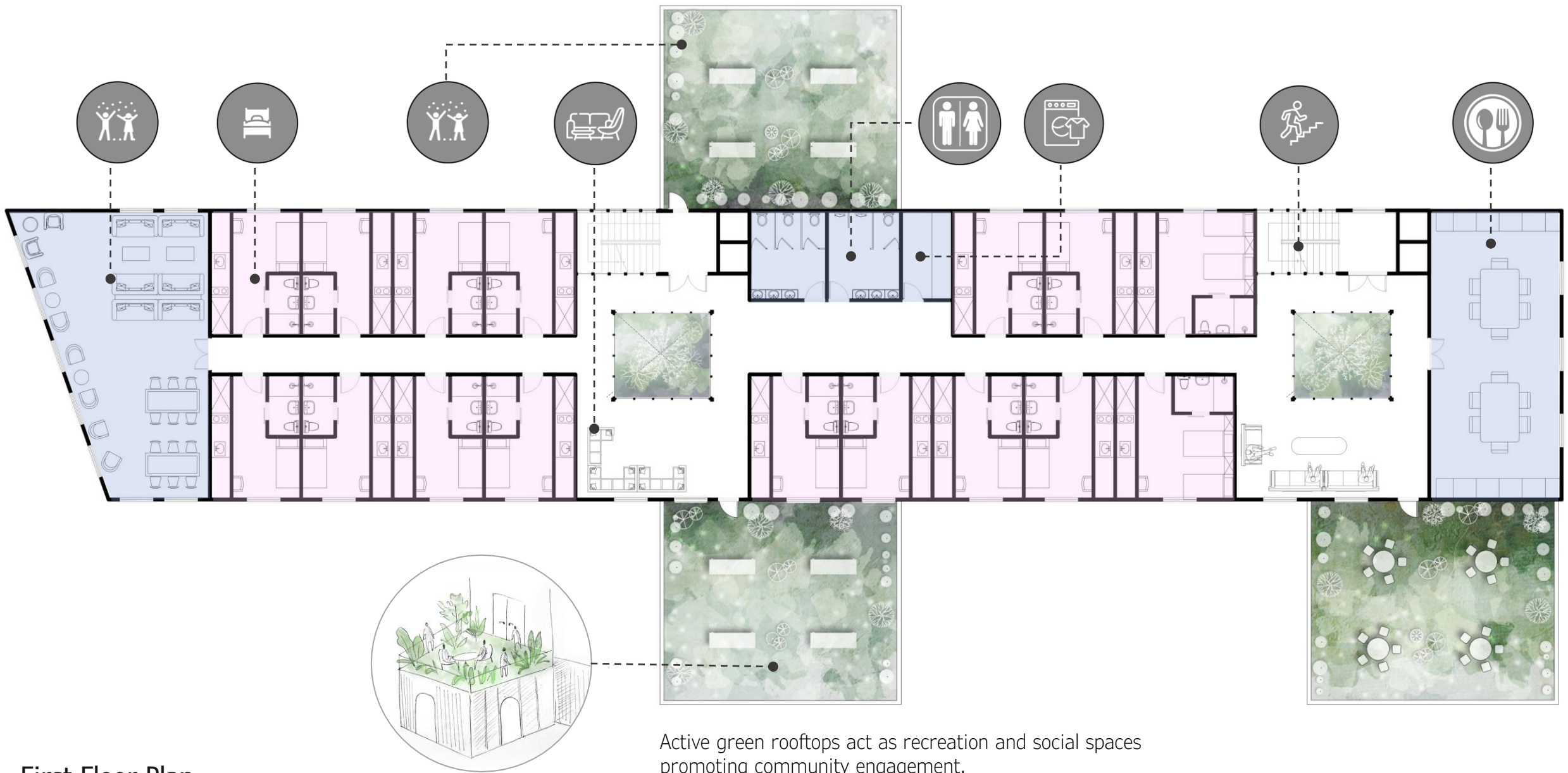


Immersive Exhibition Space (evening)



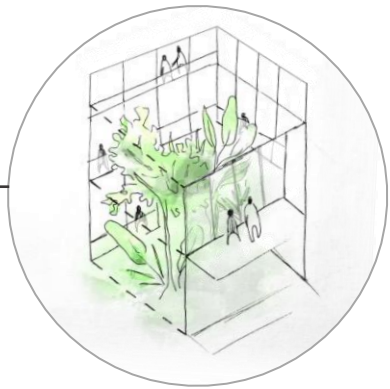
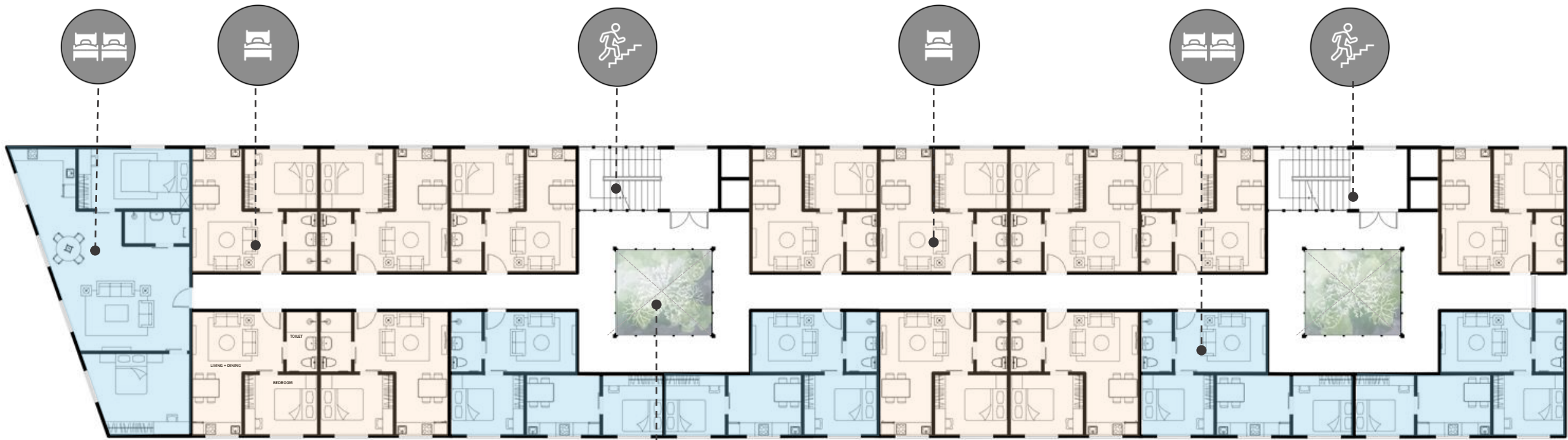


Outdoor Recreation Space



Active green rooftops act as recreation and social spaces promoting community engagement. Improved air quality and enhanced mental well-being.

First Floor Plan
CO-LIVING

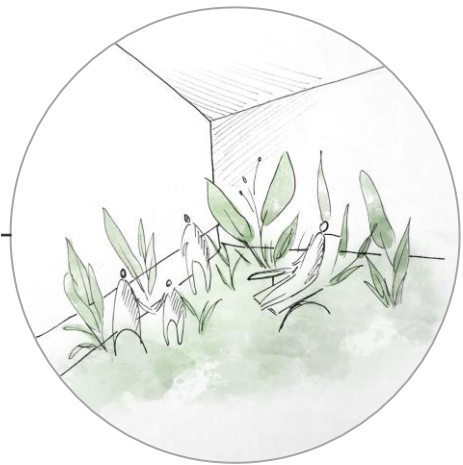


Typical Residential Plan
PRIVATE APARTMENTS

Central courtyard offers a peaceful and aesthetically pleasing environment, allowing daylight to enter within.

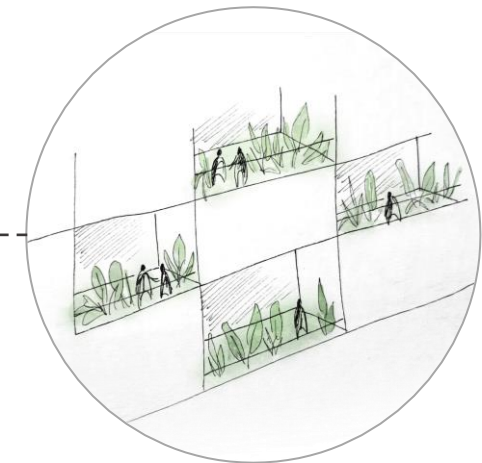


Indoor green courtyard



Inward green terraces and break out spaces are created, offering panoramic views of the site.

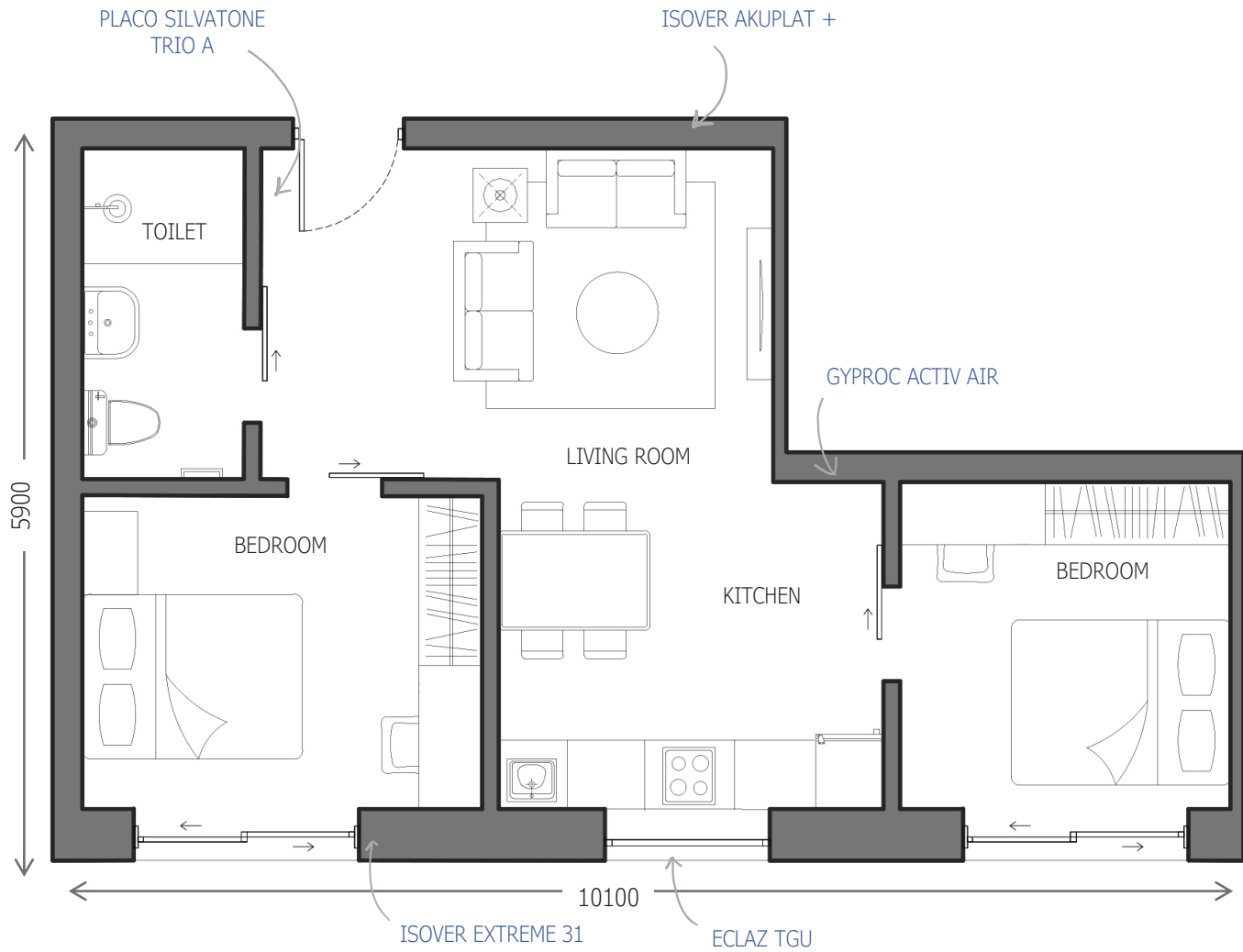
Creating ambient spaces, reduce noise and allow people to relax and unwind.



Generating Voids

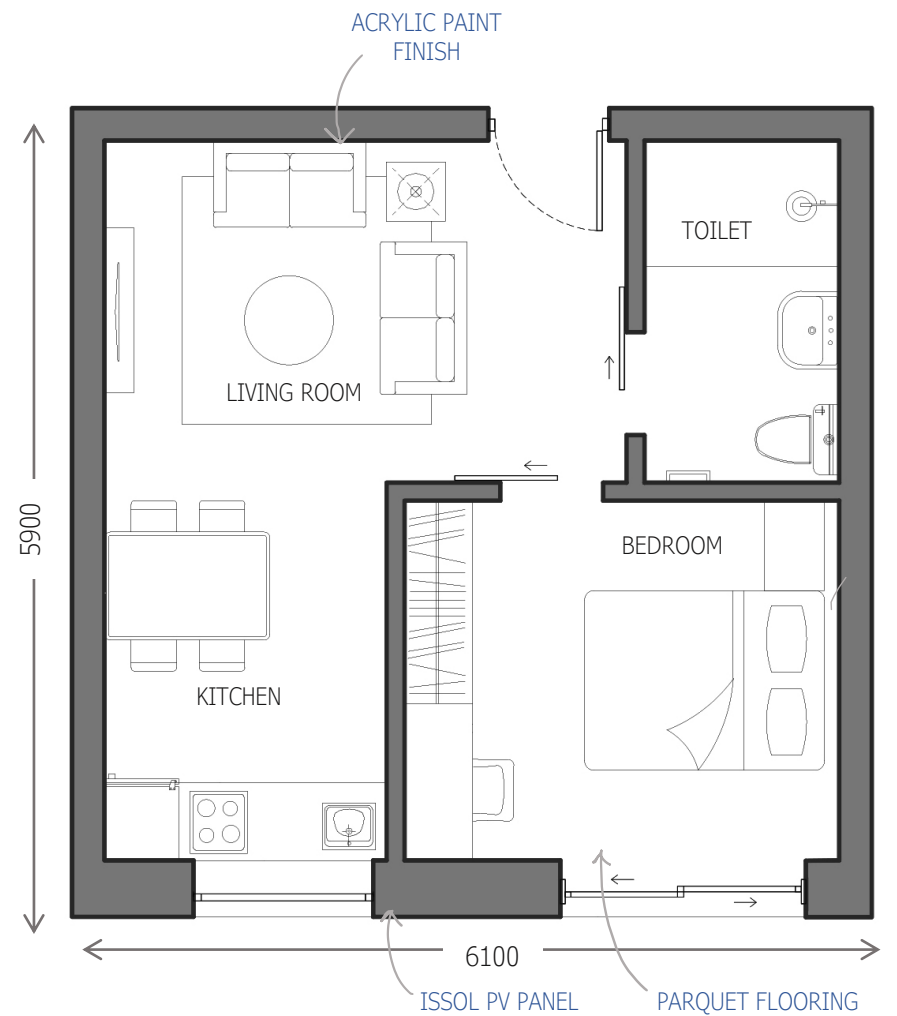


Façade View



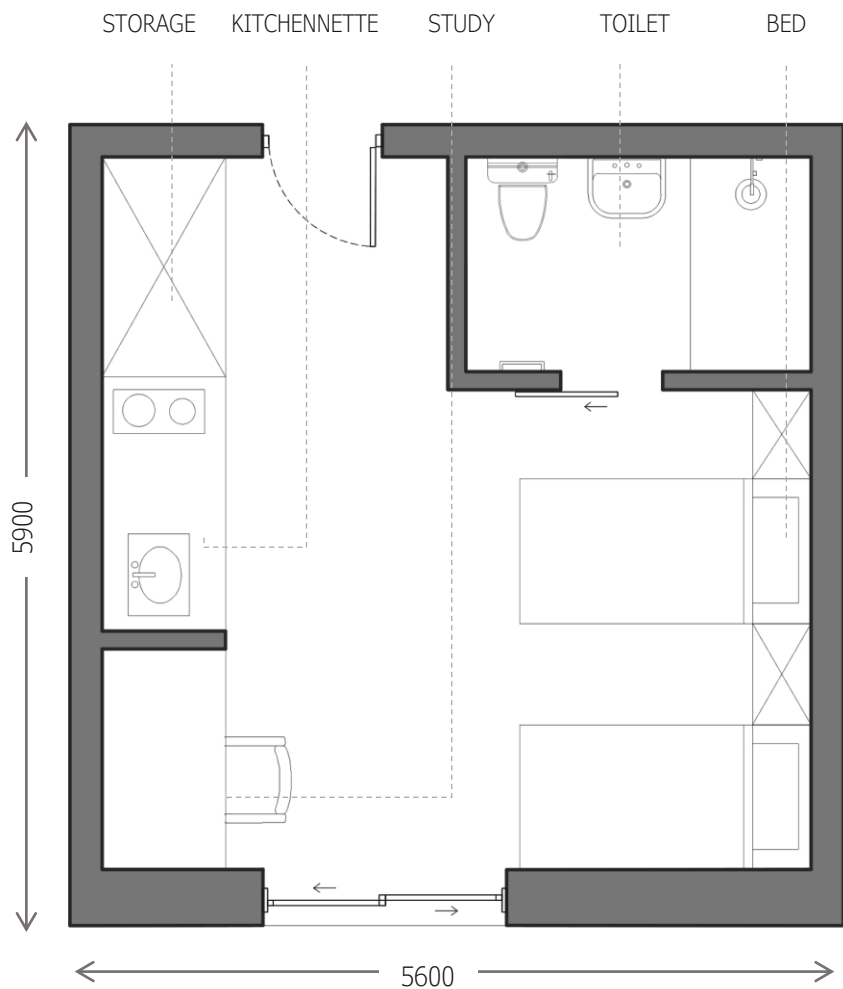
TYPE A

PRIVATE RESIDENCE (48 sq.m)

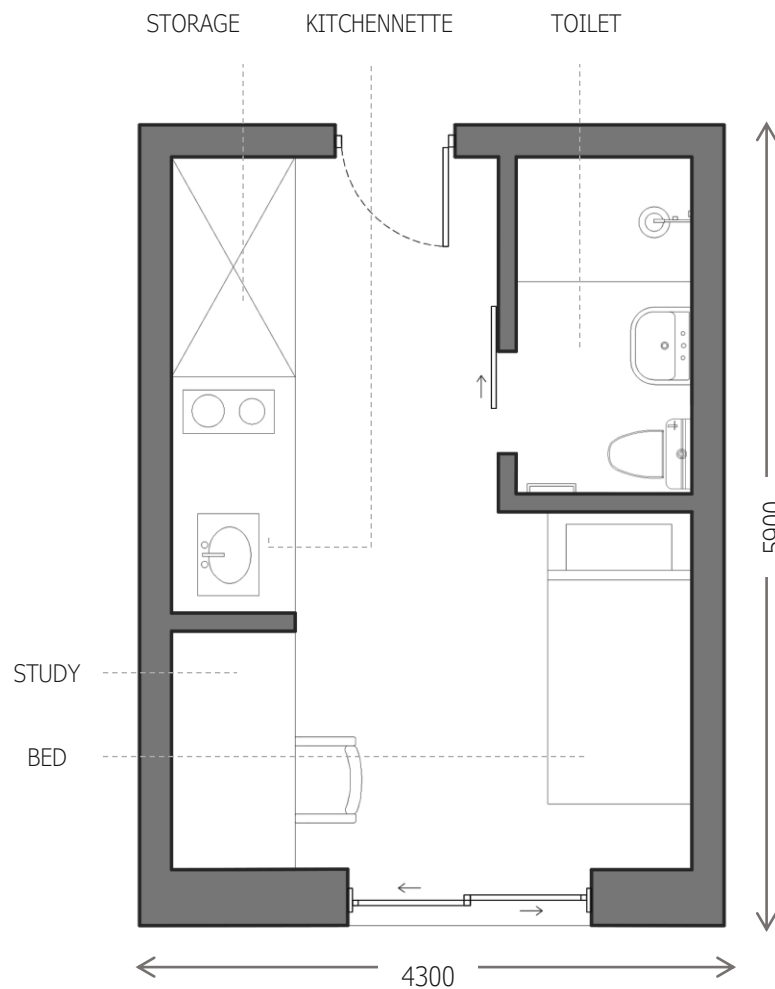


TYPE B

PRIVATE RESIDENCE (36 sq.m)



TYPE C
CO-LIVING (33 sq.m)



TYPE D
CO-LIVING (25 sq.m)

THERMAL COMFORT



Eclaz Triple Glazing unit with Swisspacer Ultimate

- Eclaz provides excellent thermal insulation. Swisspacer warm edge technology reduces heat losses from inside to the outside.

$U = 0.6 \text{ W}/(\text{m}^2\text{K})$

Energy efficiency class = A

ISOVER Extreme 31 and ISOVER Comfort 32



- Excellent thermal insulation properties, helps on saving heating costs.

ACOUSTIC COMFORT



Eurocoustic Tonga 22 A Suspended Ceiling Panel 600 x 600 modules.

- Acoustic absorption: $\alpha_w = 1.00$: class A / $NRC = 1$. Absorption class A has the highest sound absorption. Reaction to fire: A1. IAQ: Class A+

BREATHABILITY



Gyproc Activ air Board

- Improves the indoor air quality by actively reducing the formaldehyde particles present in the air.

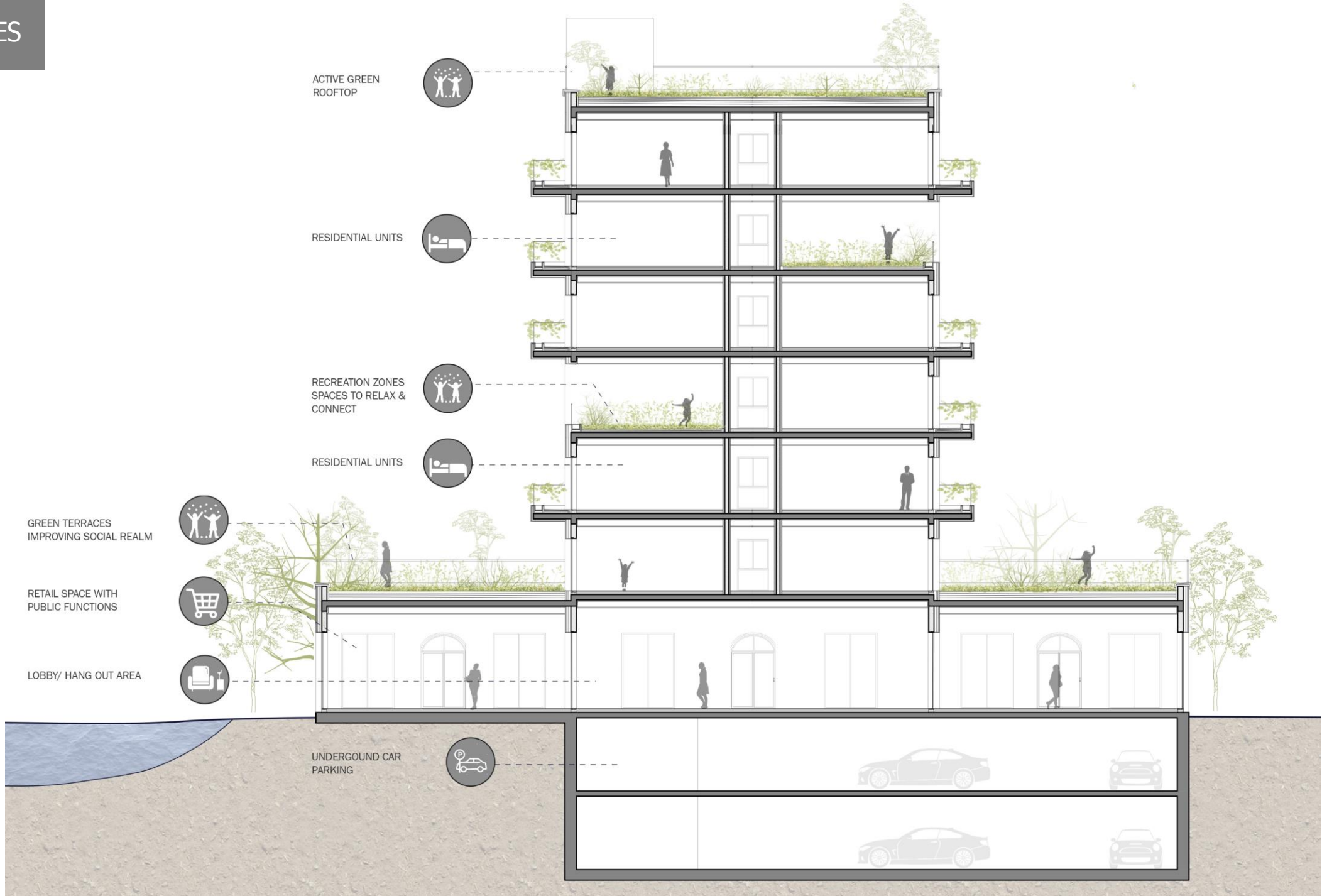


Living + Dining area view



Bedroom View

STRATEGIES



WATER



WATER RETENTION POND



RAINWATER COLLECTION



COLLECTING GREY WATER FROM FLATS

RECYCLED WATER USED IN TOILET

RECYCLED WATER PUMPED TO FLATS

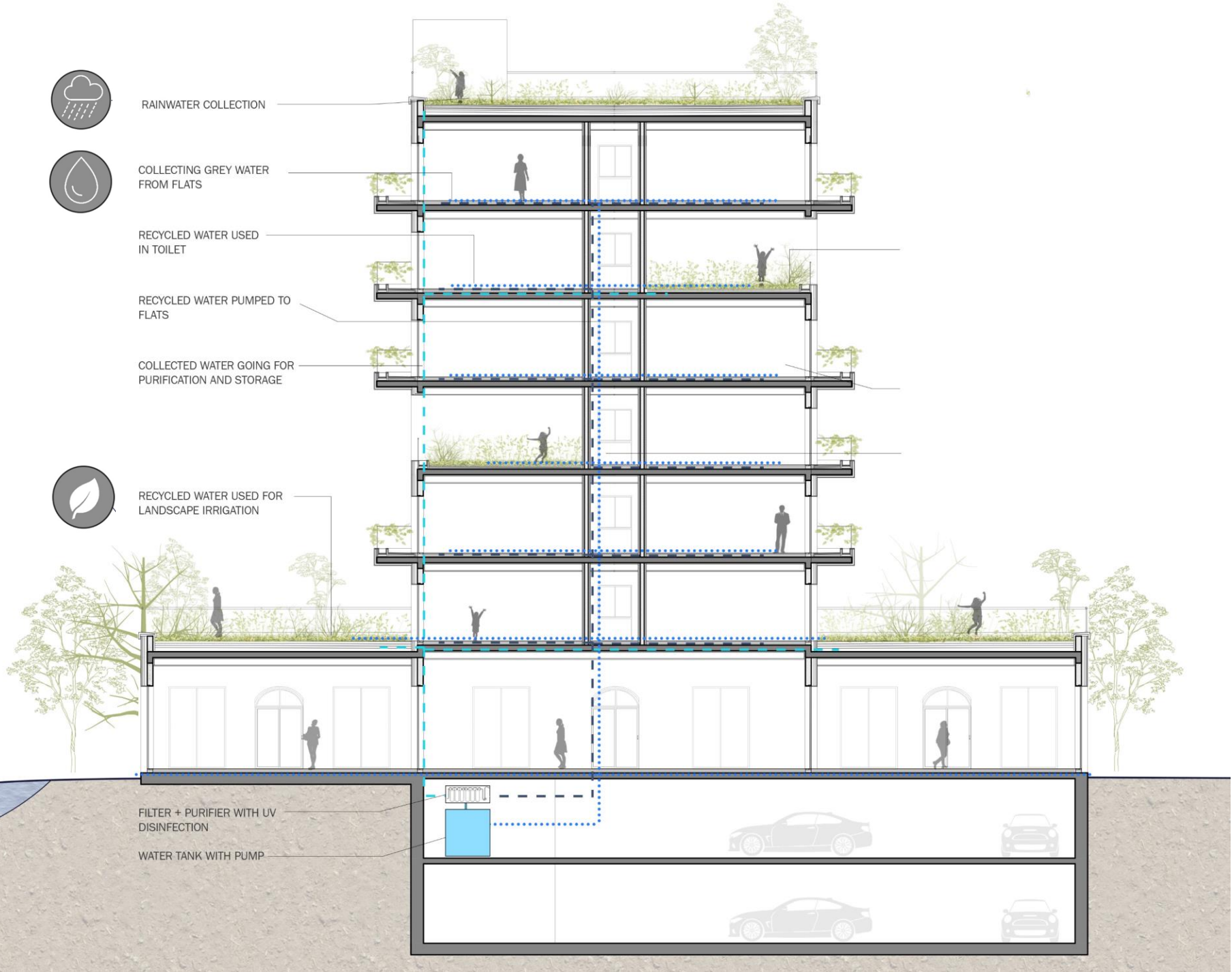
COLLECTED WATER GOING FOR PURIFICATION AND STORAGE



RECYCLED WATER USED FOR LANDSCAPE IRRIGATION

FILTER + PURIFIER WITH UV DISINFECTION

WATER TANK WITH PUMP



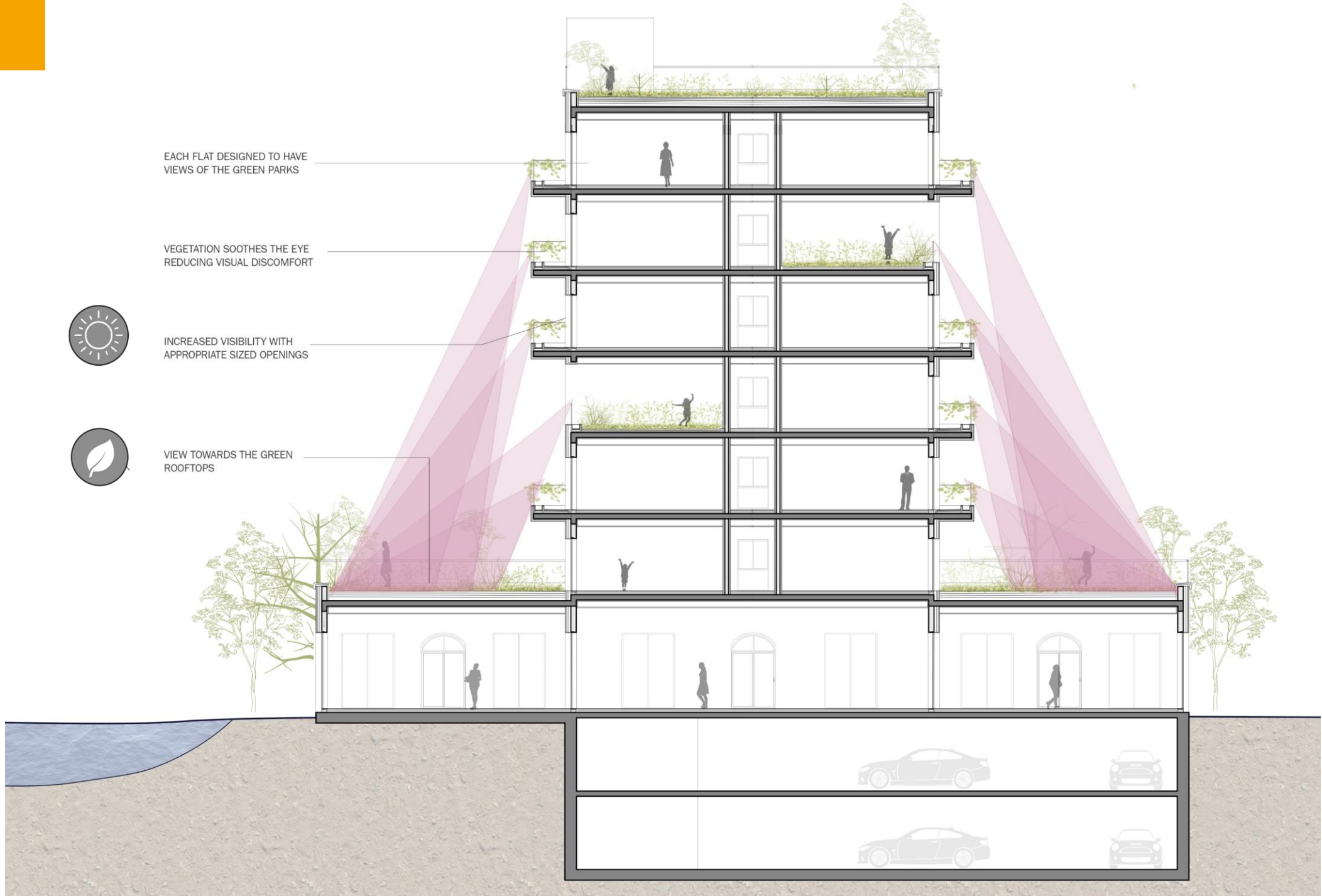
VISUAL

EACH FLAT DESIGNED TO HAVE VIEWS OF THE GREEN PARKS

VEGETATION SOOTHES THE EYE REDUCING VISUAL DISCOMFORT

INCREASED VISIBILITY WITH APPROPRIATE SIZED OPENINGS

VIEW TOWARDS THE GREEN ROOFTOPS



VISUAL



certainteed
SAINT-GOBAIN

SOLSTICE SOLAR PANEL SYSTEM ON ROOF



ISSOL

ISSOL SOLAR PANEL FACADE



SOFT REFLECTIVE WOOD FLOORING



SAINT-GOBAIN

ECLAZ TRIPLE GLAZED UNIT



SWISSPACER
The edge of tomorrow.

SWISSPACER ULTIMATE

SAINT-GOBAIN

STADIP SILENCE DECORGLASS

SAINT-GOBAIN

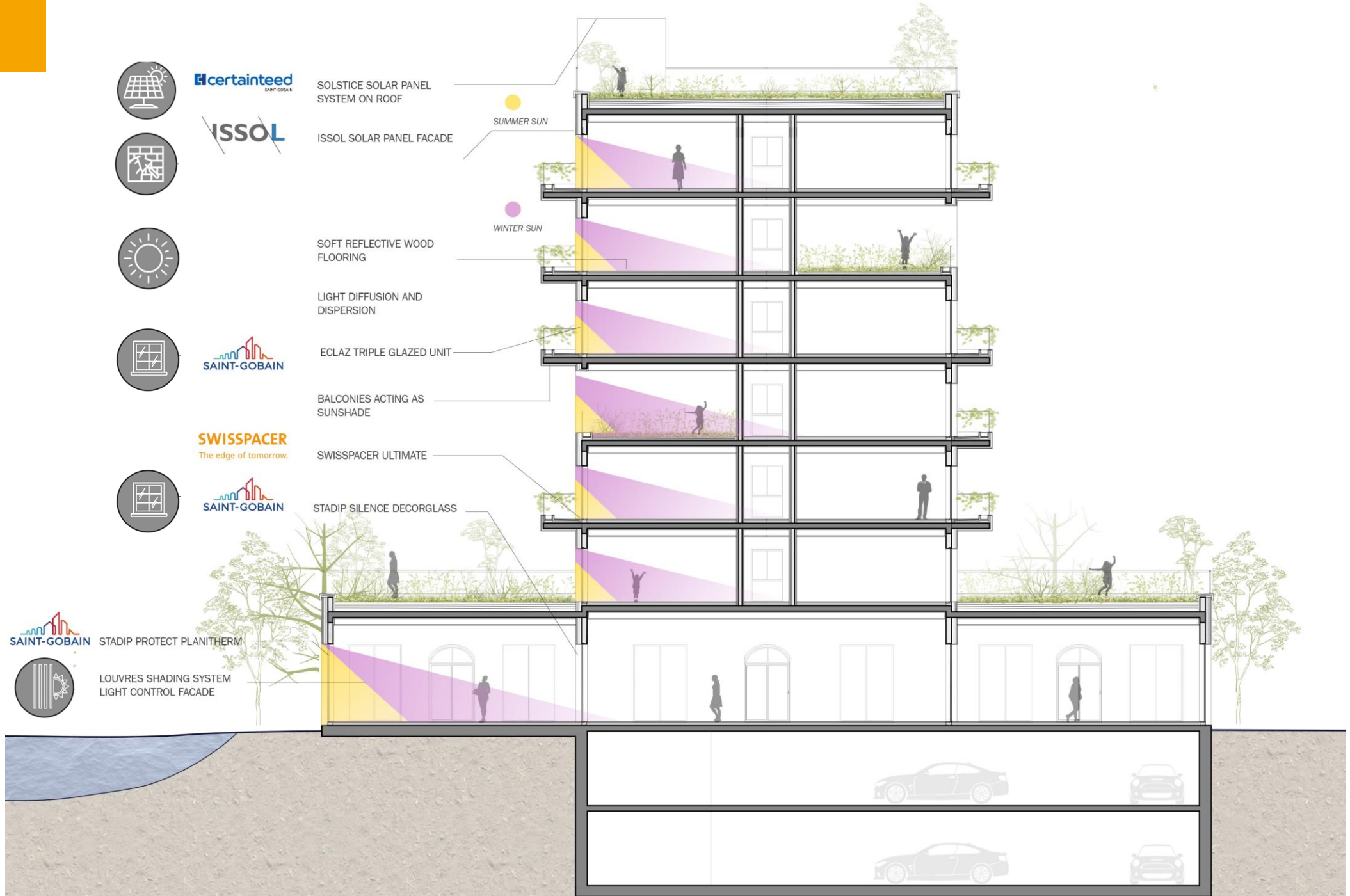
STADIP PROTECT PLANITHERM

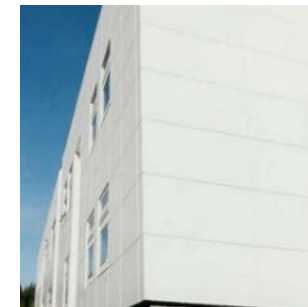


LOUVRES SHADING SYSTEM LIGHT CONTROL FACADE

SUMMER SUN

WINTER SUN

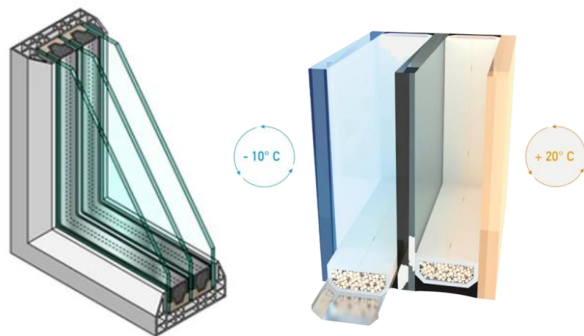




STADIP PROTECT + PLANITHERM
EXTERIOR (GROUND FLOOR AND RETAIL)



Providing protection against injury, vandalism, UV light. Used for guarding. Energy efficient glass for comfortable places. Limits the heat transfer by radiation $R_w=36\text{ dB}$



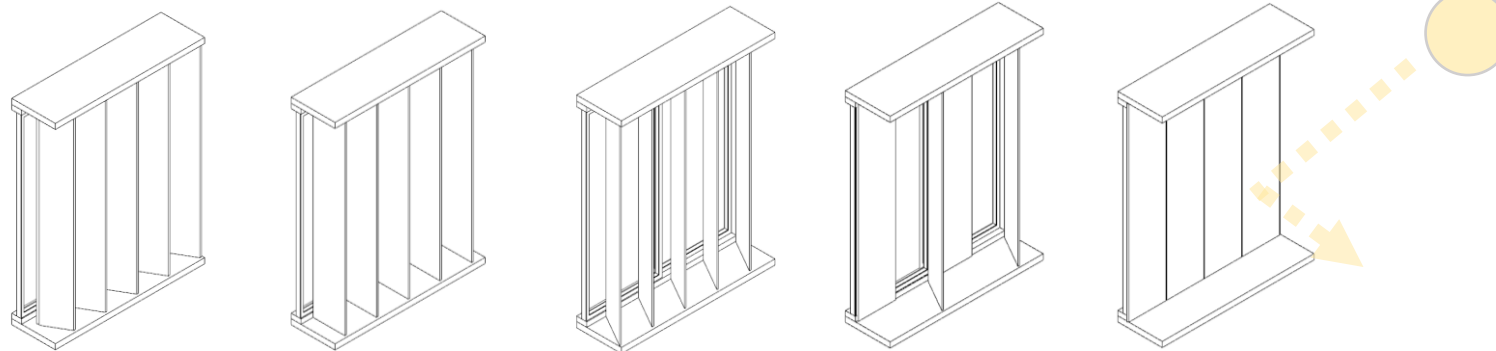
STADIP SILENCE + DECORGLASS
INTERIOR (PARTITION)



Effectively keeps out intrusive sounds, ensuring work, live and sleep in peace. Visual aesthetic pattern glass transmits light, dispersing it ever so subtly. $R_w= 42\text{ dB}$

ISSOL WHITE PV PANEL
FAÇADE

Fully tempered laminated safety glass. It is equipped with photovoltaic high-efficiency mono crystalline cells



ECLAZ TGU + SWISSPACER ULTIMATE
EXTERIOR (RESIDENTIAL)

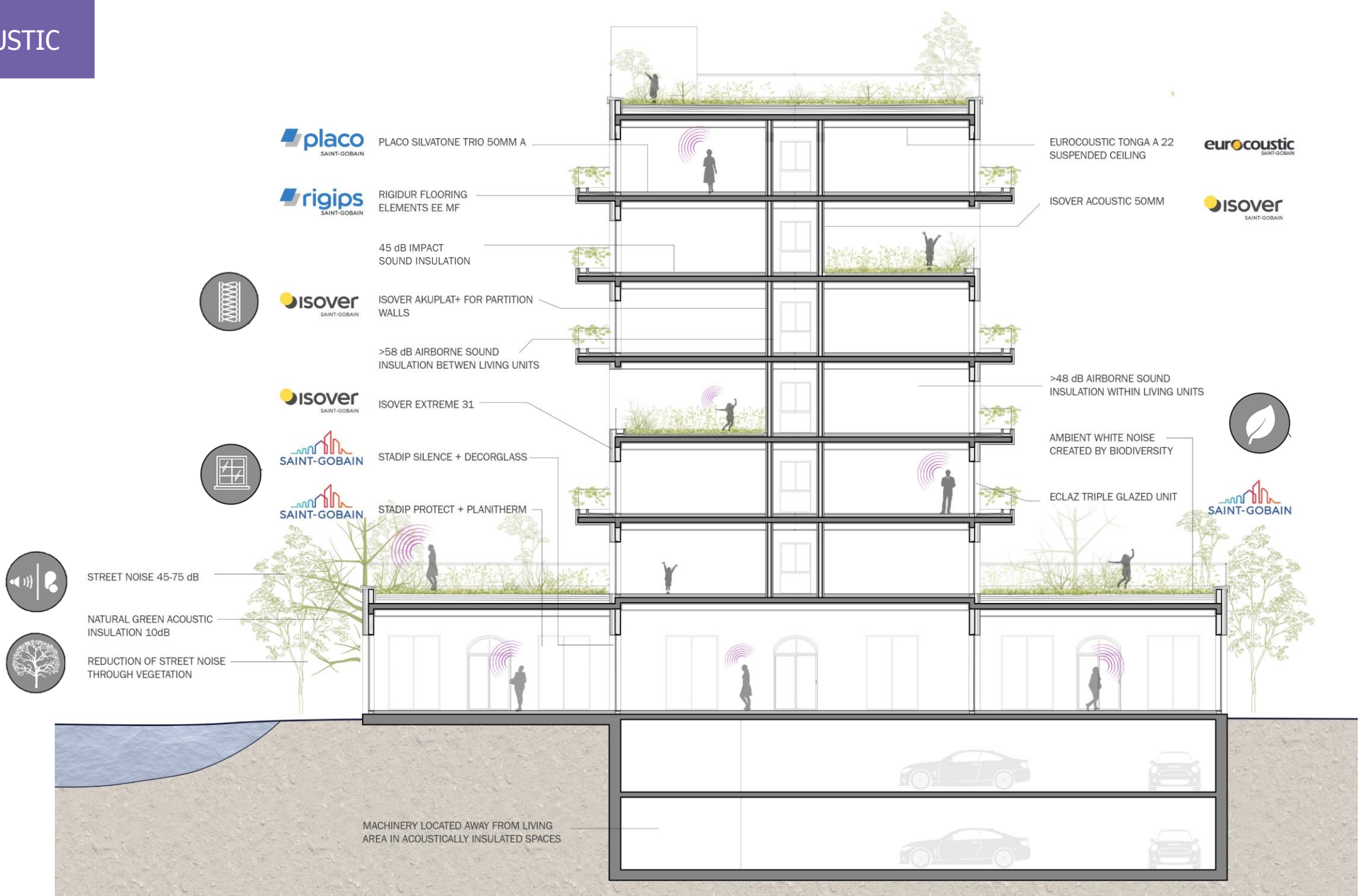


Aesthetic, thermal insulation, solar gains, natural light, ECLAZ enables to achieve the highest energy efficiency requirements

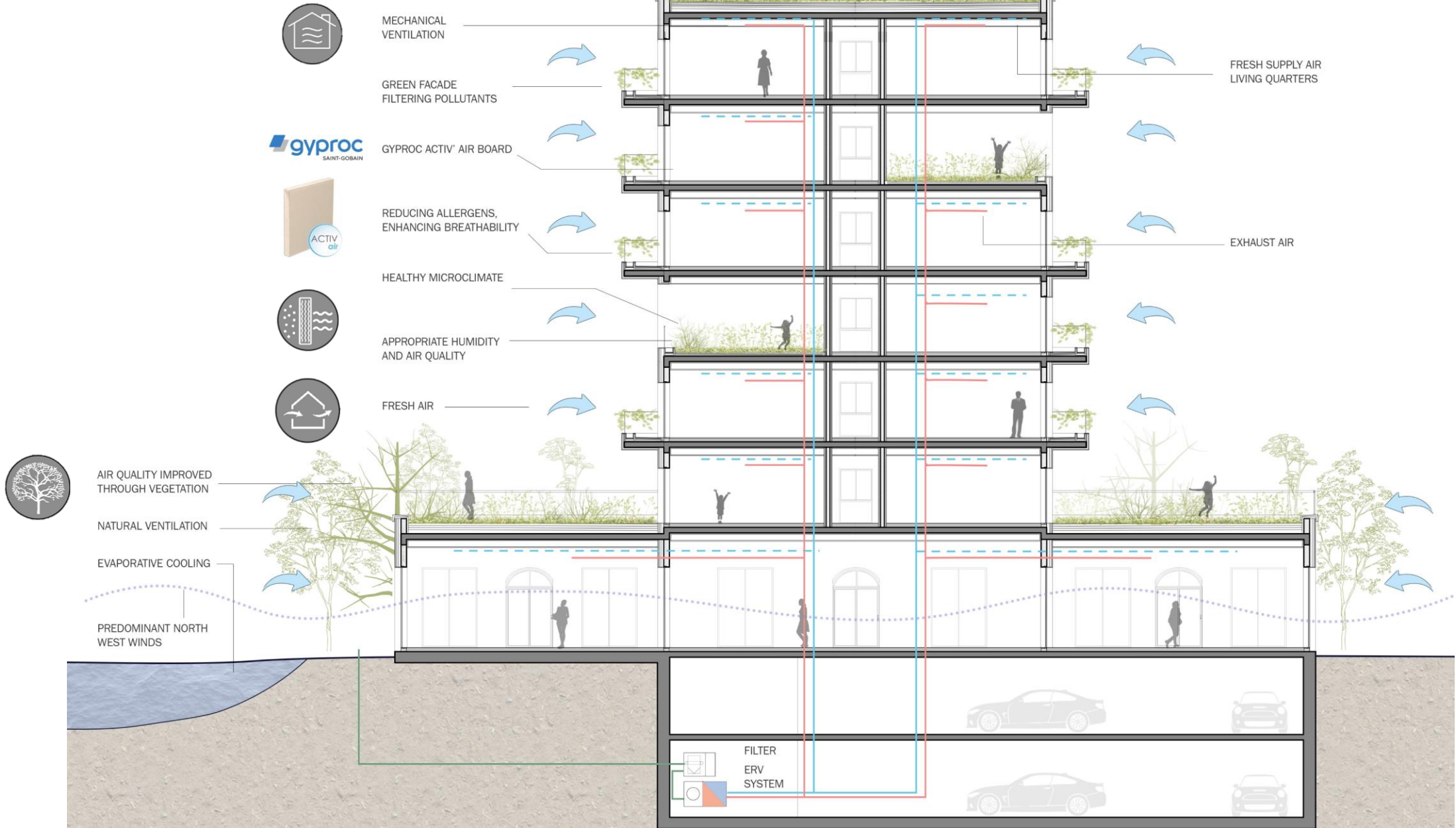
EXTERIOR VERTICAL LOUVRES

Allows controlling the incoming light through multiple combinations. Changing the amount of light entering within room. Improving visual comfort.

ACOUSTIC



BREATHE





STACK VENTILATION EFFECT

1. The central void facilitates stack ventilation.
2. The hot air rises and escapes from the opening,
3. The cool fresh air from the environment rushes in.
4. This helps in generating a natural ventilation effect, refreshing the interiors.

GREEN FAÇADE SCREEN

Vertical plant screens are placed at the balconies filtering the air from pollutants.

Thus, improving the air quality and breathability.

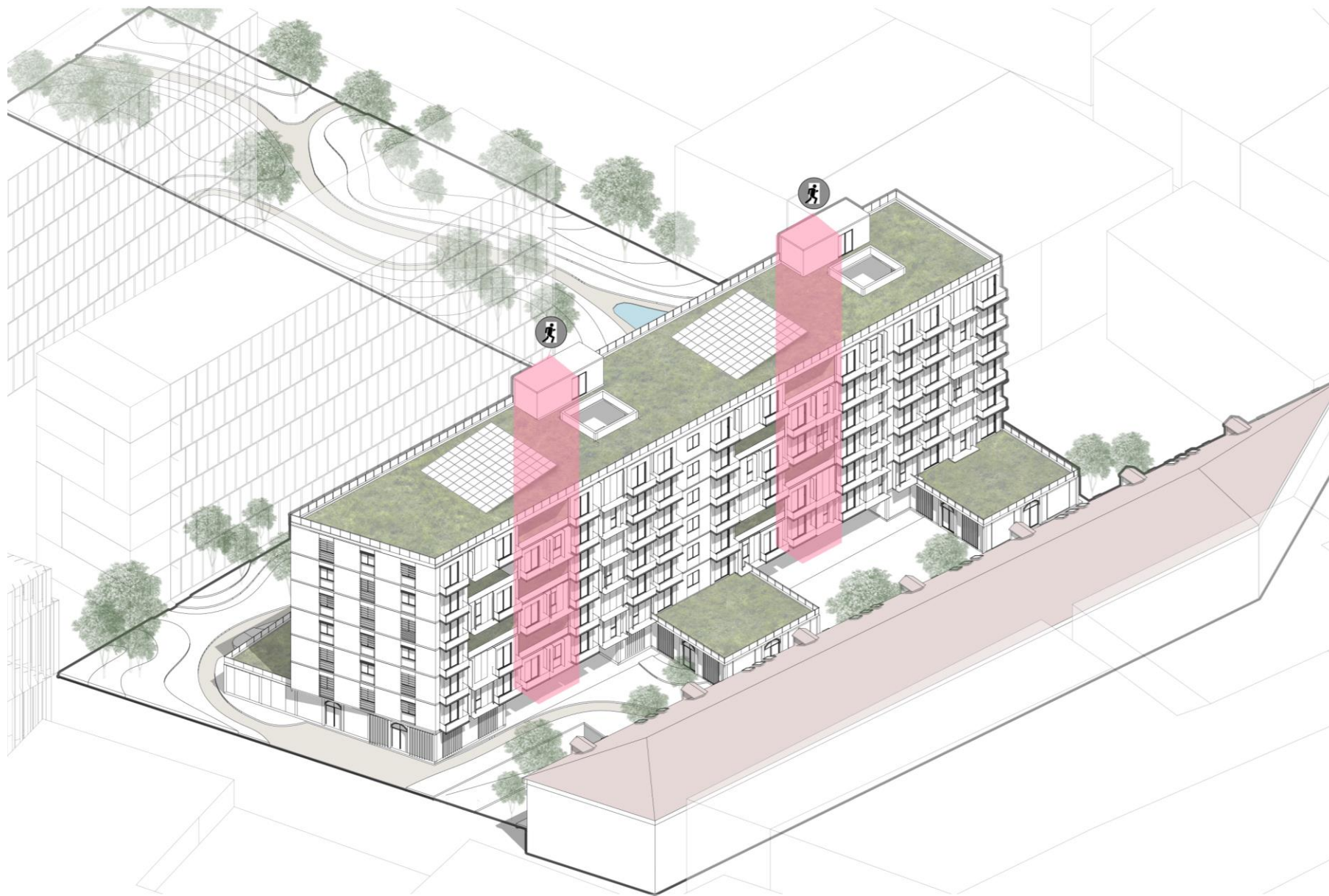


ERV SYSTEM

In summers, the system pre-cools and de-humidifies the intake air;

In winters, the system humidifies and pre-heats the incoming air.

Improves indoor air quality, controls Indoor Relative Humidity, reduces total HVAC and energy load.



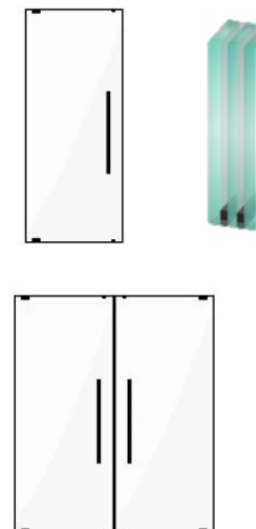
FIRE EVACUATION ROUTES
highlighted in diagram are designed
in accordance with the Portugal
standards.

VETROTECH
LUNAX PORTA

vetrotech
SAINT-GOBAIN

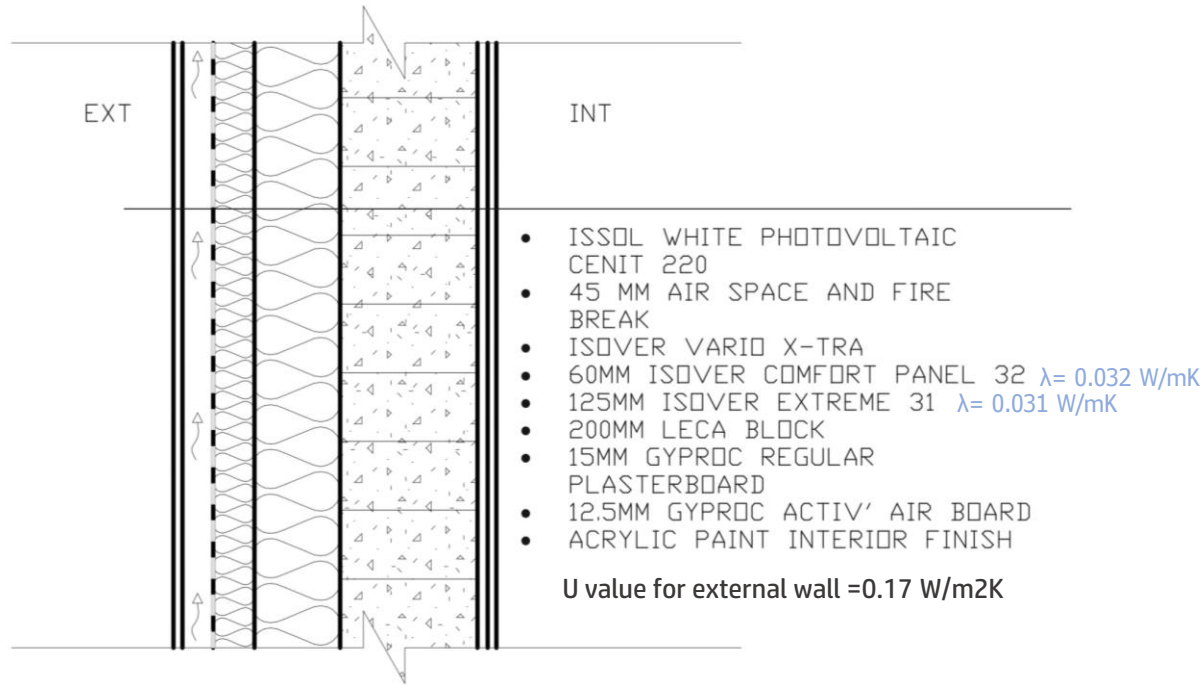
EL 60 SWING DOOR

Using Fire Resisting glass doors.
Utilizes full door sized **CONTRAFLAM**
glass pane offering full heat insulation.
E/EW and EI fire-resistance up to 60
minutes.

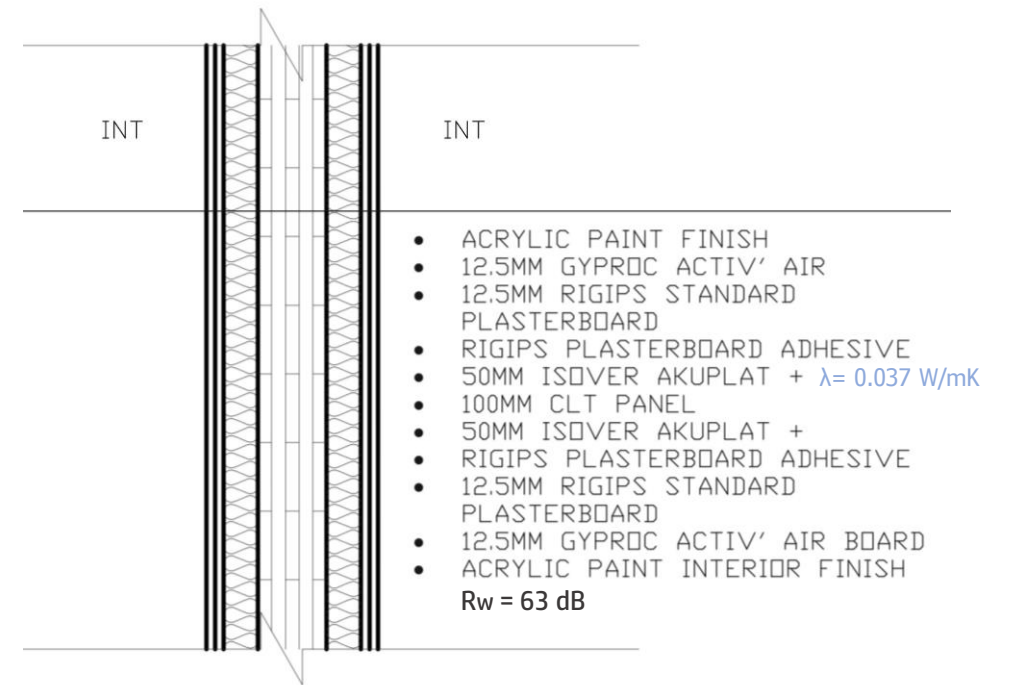


Façade made from non-combustible
materials with a **Fire Rating of A1**

EXTERNAL WALL DETAIL: A1



PARTITION WALL DETAIL: A2



SAINT GOBAIN BRANDS INCORPORATED;

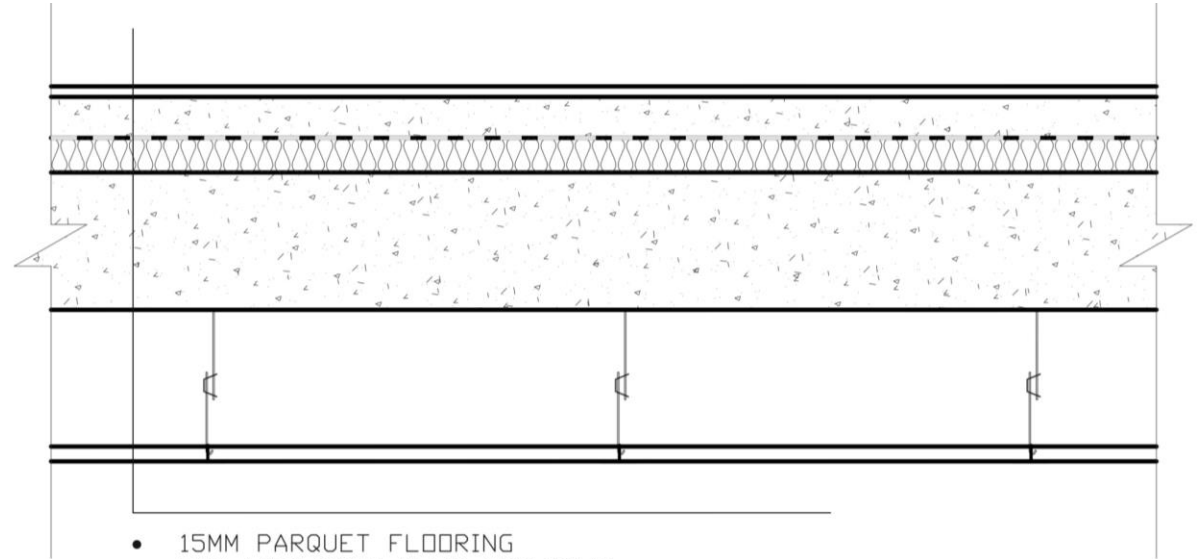


SAINT GOBAIN BRANDS INCORPORATED;





FLOORING DETAIL: A3



- 15MM PARQUET FLOORING
- 5MM WEBERSET PLUS ADHESIVE
- 50MM WEBERFLOOR BASE RAPID 4360 SCREED
- WEBERFLOOR DAMP PROOF MEMBRANE
- 50MM PLACO SILVATONE TRIO A $\lambda = 0.038 \text{ W/mK}$
- 200MM REINFORCED CONCRETE SLAB
- EUROCOUSTIC T24 QUICK LOCK CLIP ON HANGING SYSTEM
- 22MM EUROCOUSTIC TOGA A 22 SUSPENDED CEILING $\alpha_w = 1.00$
 $\lambda = 0.035 \text{ W/mK}$

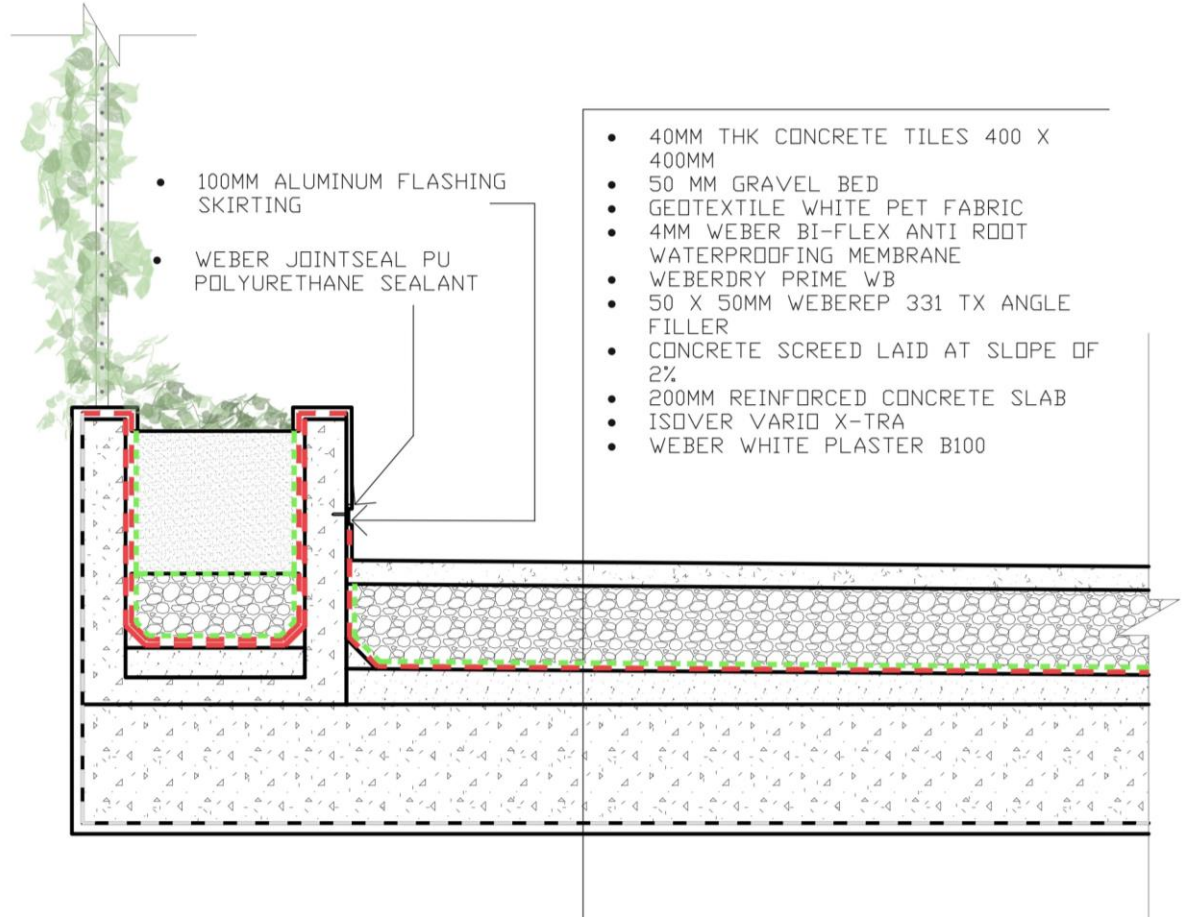
SAINT GOBAIN BRANDS INCORPORATED;





A4

BALCONY DETAIL: A4



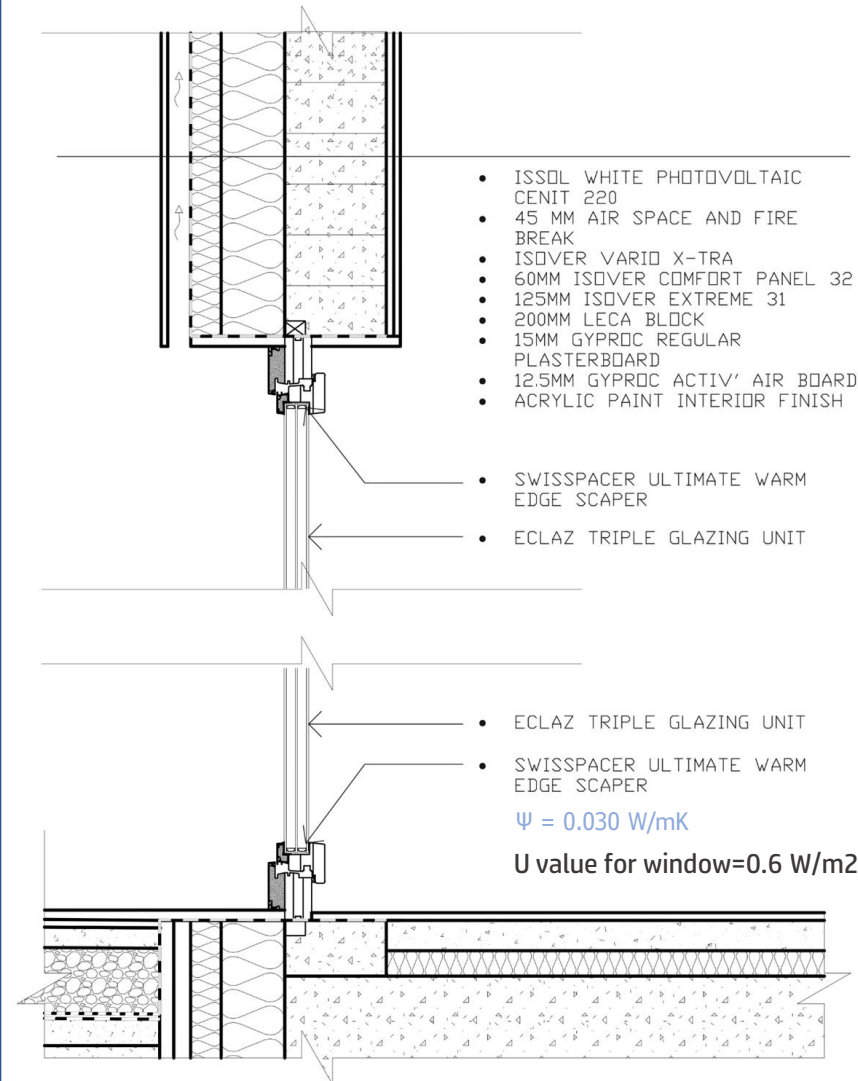
SAINT GOBAIN BRANDS INCORPORATED;





Physical Model

DETAIL: A5

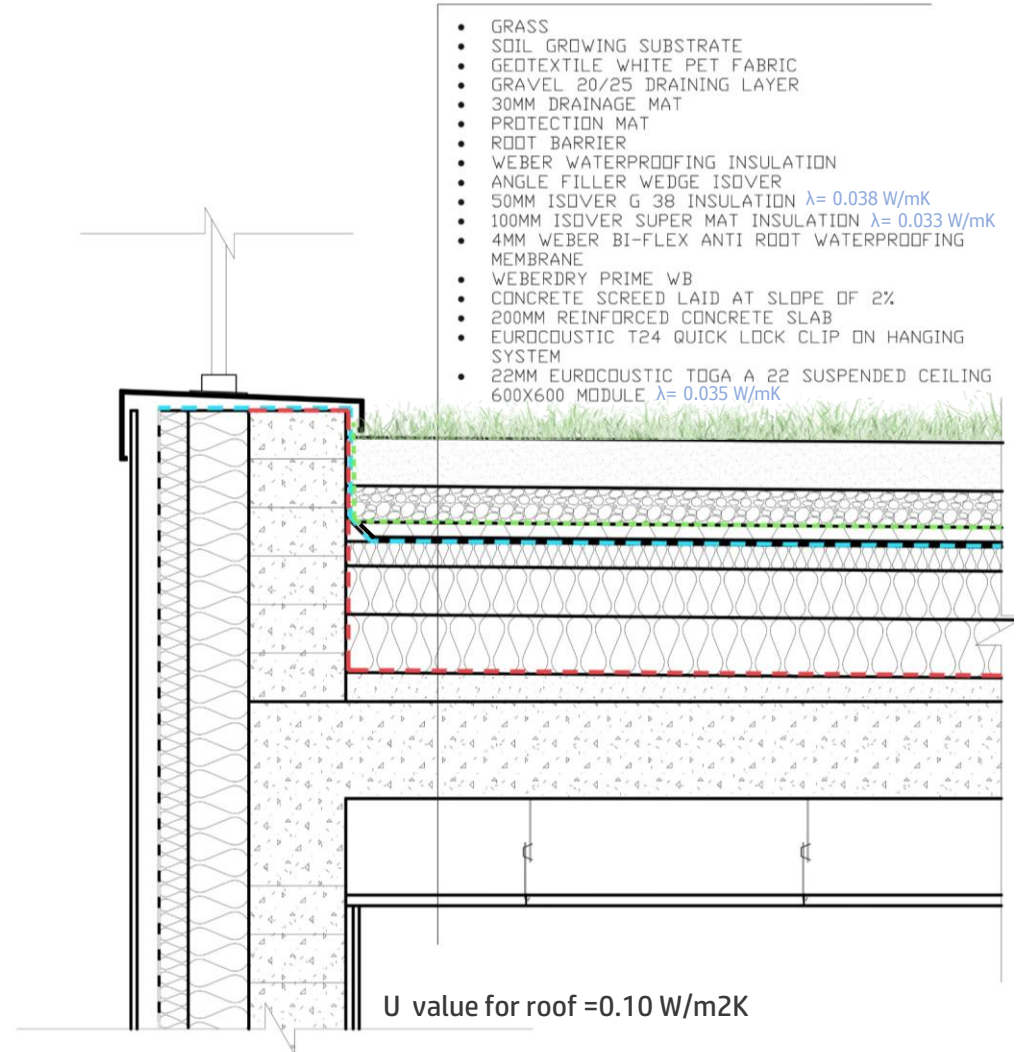


SAINT GOBAIN BRANDS
INCORPORATED;





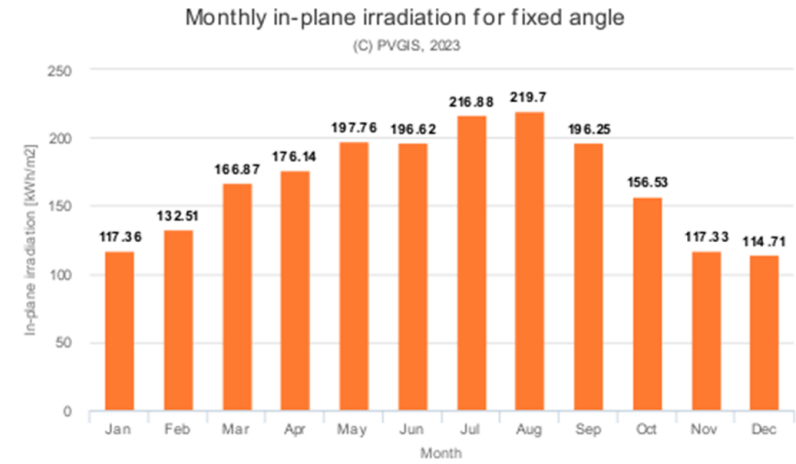
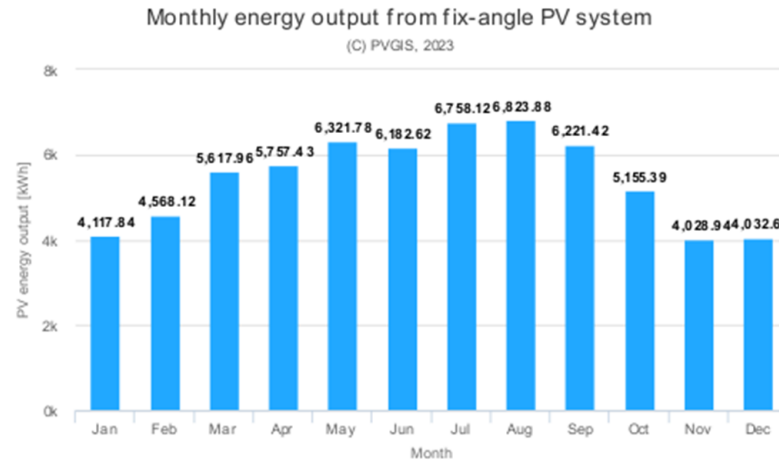
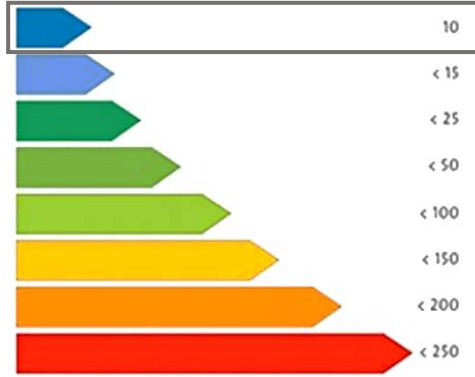
ROOF DETAIL: A6



SAINT GOBAIN BRANDS INCORPORATED;



ENERGY EFFICIENCY



9.42
kWh/(m2a)

Specific Heat Demand Achieved

65,586
kWh/a

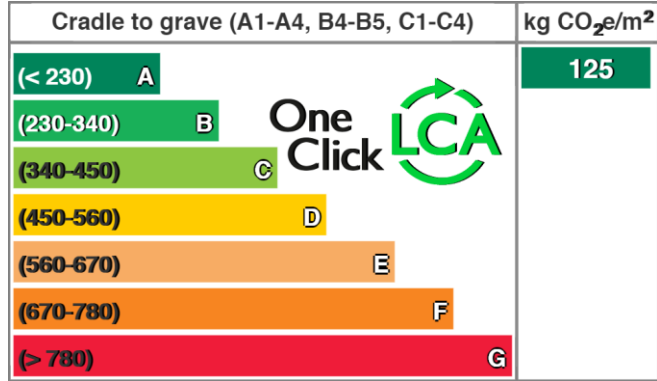
Power generated from PV System

Transmission Heat Losses	86758.39	kWh/a
Ventilation Heat Losses	135054.04	kWh/a
Total Heat Losses	221812.43	kWh/a
Internal Heat Gains	48635.46	kWh/a
Solar Heat Gains	111252.15	kWh/a
Total Heat Gains	159887.61	kWh/a
Annual Heat Demand	61924.82	kWh/a
Specific Heat Demand	9.42	kWh/(m2a)
Annual energy demand for heating < 15 kWh/(m2a) achieved;	YES	
Air Change Rate	0.5	1/h
Air Change Rate < 0.6 1/h achieved;	YES	

Energy Output from the PV system

January	4117.84	kWh
February	4568.12	kWh
March	5617.96	kWh
April	5757.43	kWh
May	6321.78	kWh
June	6182.62	kWh
July	6758.12	kWh
August	6823.88	kWh
September	6221.42	kWh
October	5155.39	kWh
November	4028.94	kWh
December	4032.69	kWh
Total	65586.19	kWh/a

ONE CLICK LCA RESULTS



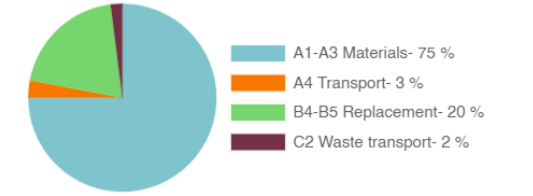
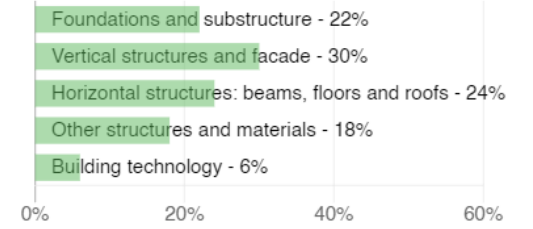
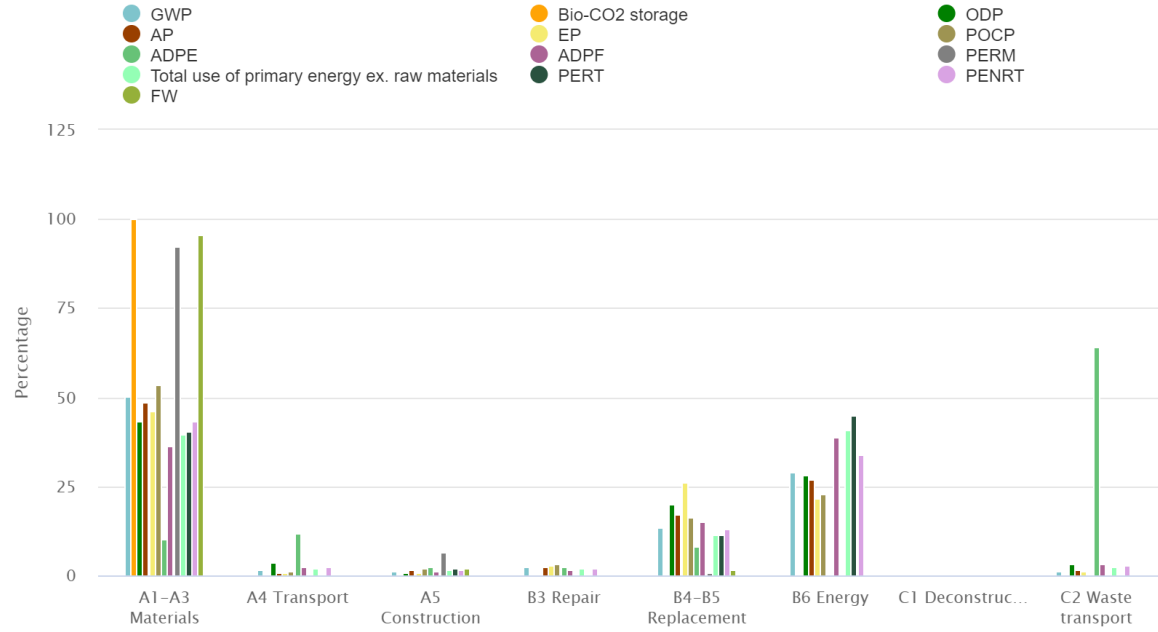
1.29 Tonne

CO₂ emissions captured in 1 year through vegetation

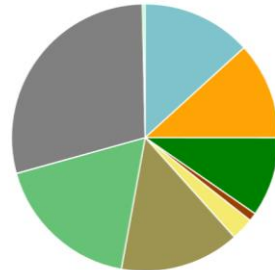
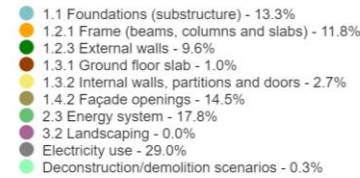
64.84 Tonne

CO₂ emissions captured in 50 year through vegetation

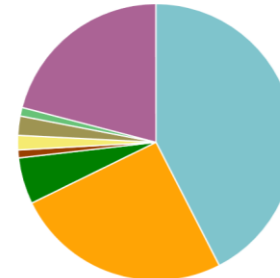
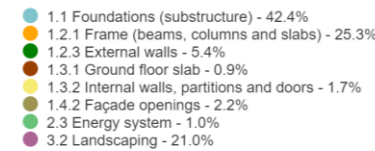
Results by life-cycle stage



Global warming kg CO₂e - Classifications



Mass kg - Classifications



Global warming kg CO₂e - Life-cycle stages

