ARCHITECTURE STUDENT CONTEST

19th INTERNATIONAL EDITION, HELSINKI 2024

MEET THE TEAM

TEAM 23

MANIPAL ACADEMY OF HIGHER EDUCATION

UNITED ARAB EMIRATES

VICTORIA GINGER-EKE

ARINA ARUN

ALAN BEKKER


MASTER PLAN YOGA
DEFINED

SITE ANALYSIS

TRANSIT MAP

RAIDE JOKERI LIGHT RAIL

CYCLE TRACKS

BUS STOPS

GREENERY ANALYSIS

ZONING

UNIVERSITY FUNCTIONS AREA

WORKPLACE AREA

RESIDENTIAL AREA

SITE ANALYSIS

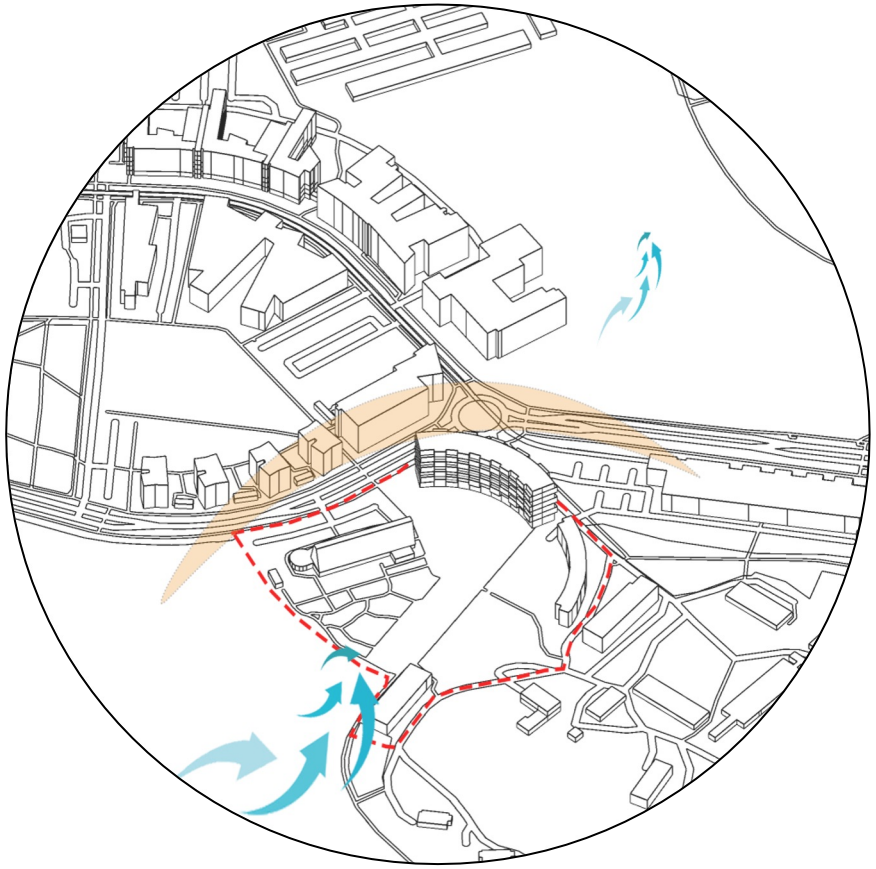
WARM SEASON: June to August (16°C).
Hottest month: July (21°C -- 23°C).

COLD SEASON: November to March (2°C).
Coldest Month**:** February (8°C ~ -2°C.).

WINDIEST MONTHS: November and December.

SUMMER SOLSTICE: Experiences the midnight sun. Up to 19 hours of daylight.

WINTER SOLSTICE: Experiences polar night phenomenon. Less than 6 hours of daylight.



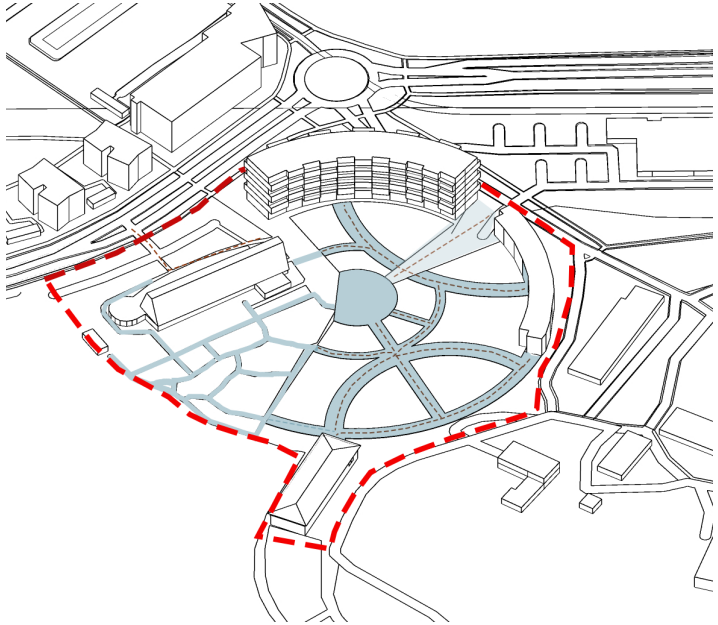
STRENGTH:
- **With onset of tramline, area develops into a sustainable innovation hub.**

- **Abundance of green spaces.**

WEAKNESS:
- **Lack of leisure/ entertainment spaces in proximity catering to students.**

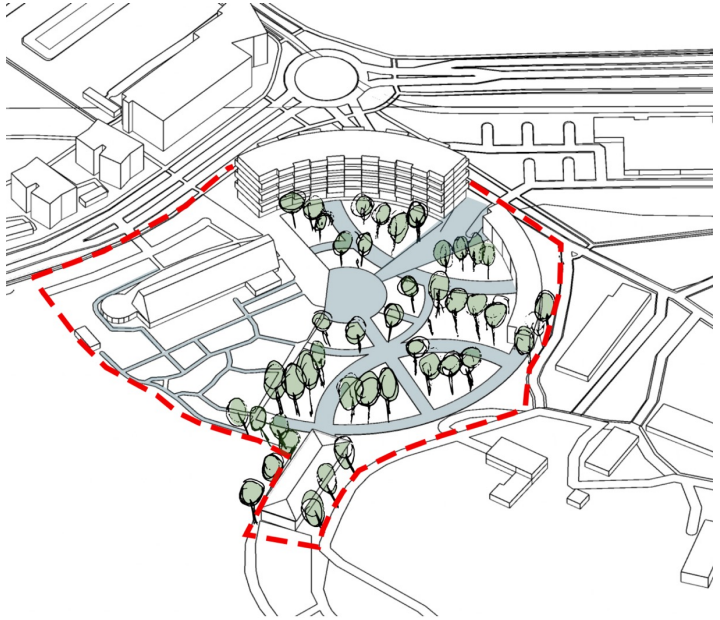
- **Lack of connection between zones.**

MASTERPLAN ANALYSIS



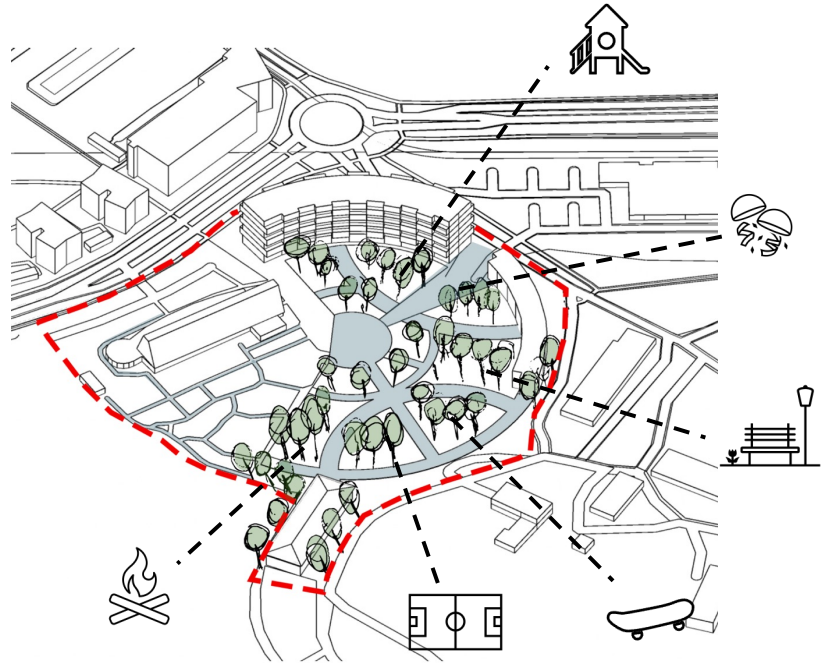
CONNECTION

Improving connection between all four zones.



LANDSCAPING

Maximizing green areas, enhancing biodiversity and improving air quality.

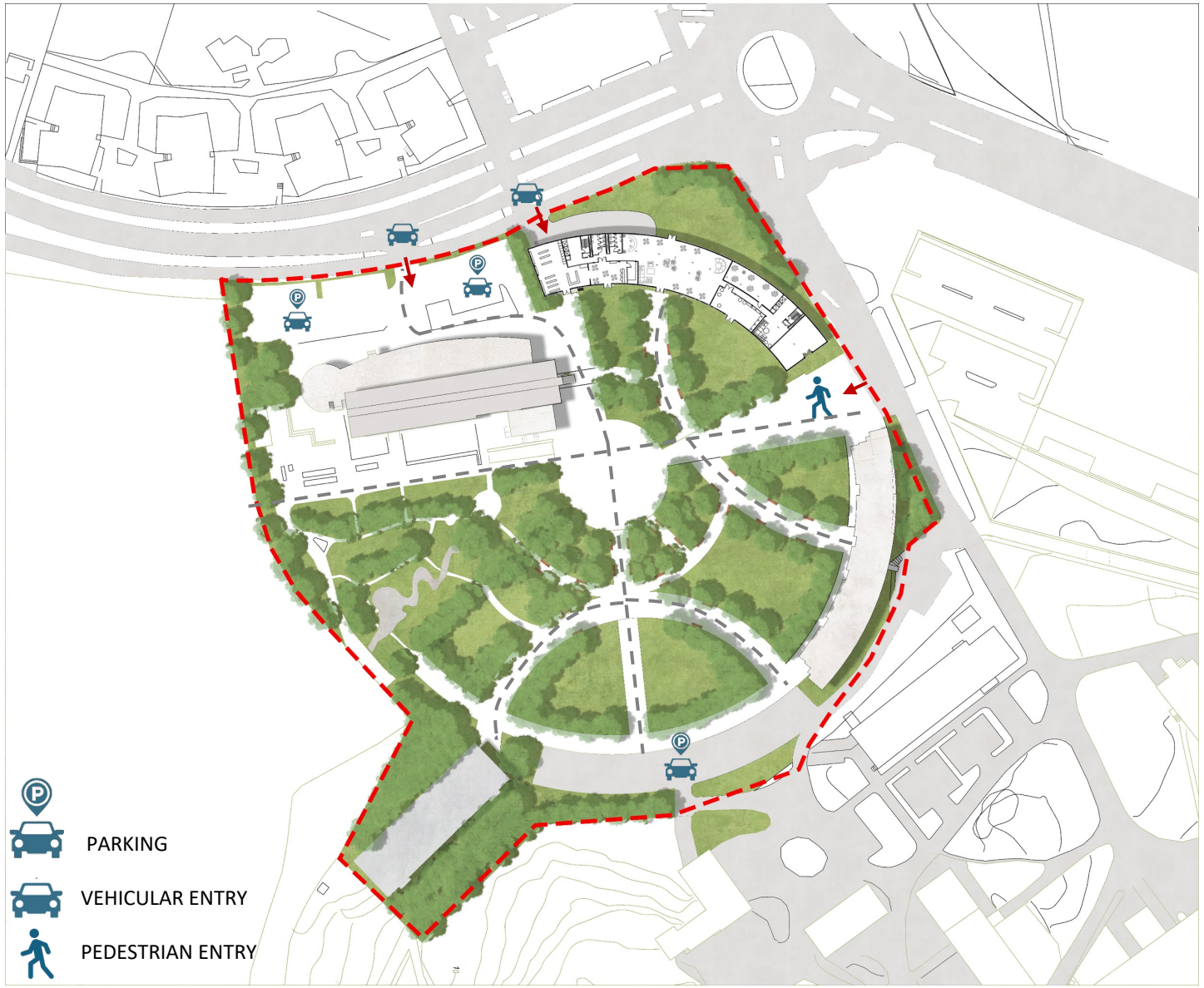


ZONES

Incorporating functions catering to people’s needs fostering sense of community.

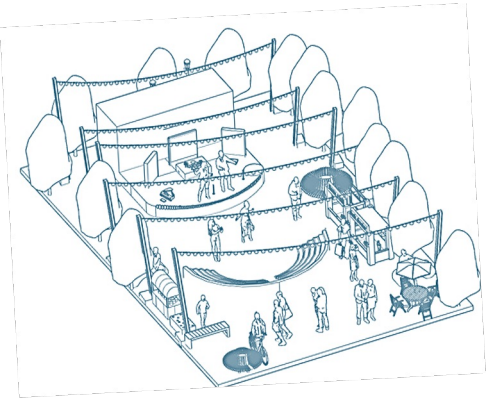
MASTERPLAN

GROUND LEVEL

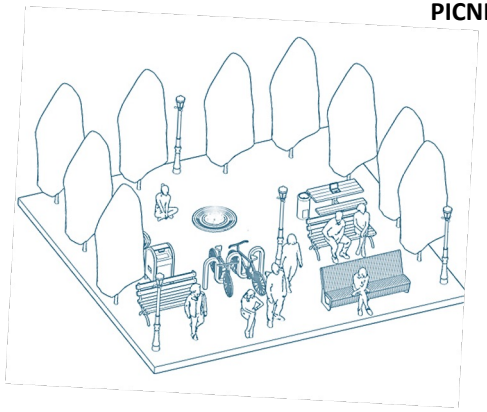


MASTERPLAN FUNCTIONS

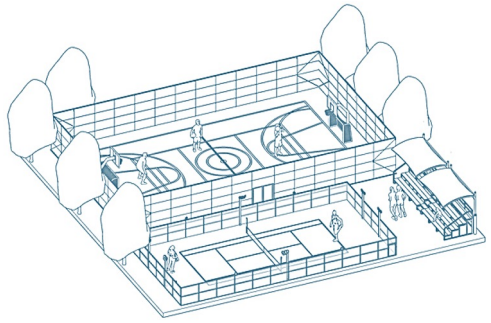
EVENT AREA/OUTDOOR THEATRE
(1250 SQM)

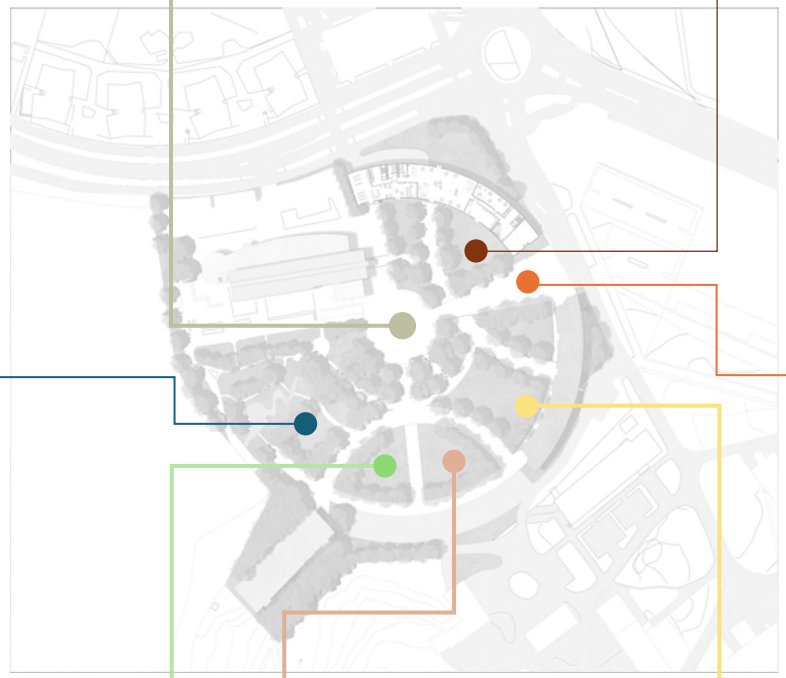


PICNIC/CAMPING AREA
(931 SQM)

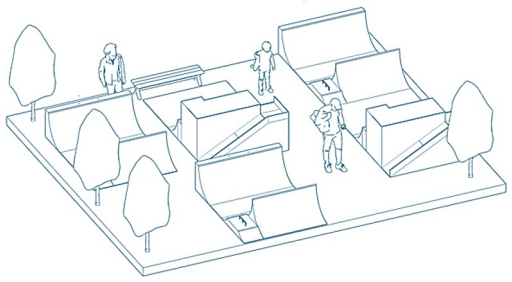


SPORTS COURT
(973 SQM)

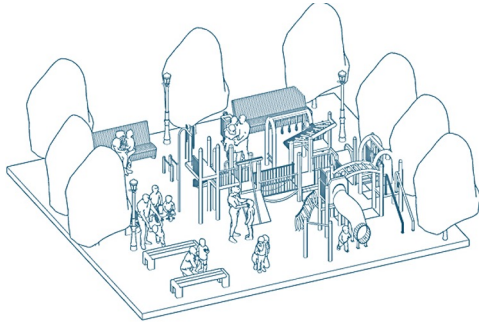




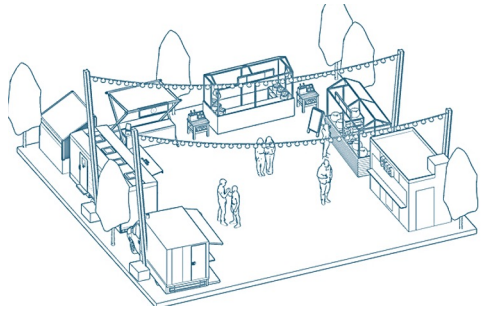
SKATE PARK
(1000 SQM)



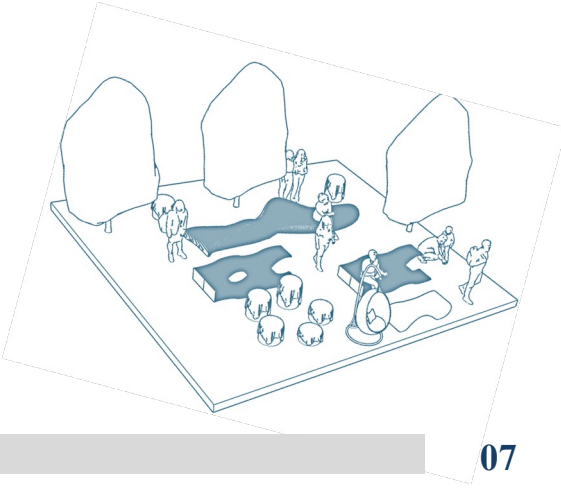
PLAYGROUND /SEATING AREA
(452 SQM)



FESTIVAL STREET
(1148 SQM)



SEATING AREAS
(1000 SQM)



CONNECTION BETWEEN BUILDINGS

FESTIVAL STREET

- Promoting strong ties within the community by holding events and shared experiences.
- Cultivating long-lasting connections between the residential buildings.
- Transforming the existing Hakalantie Road to a vibrant festival street.

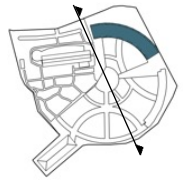

HEAT

CONNECTION BETWEEN BUILDINGS

- The back facade of Building A features voids mirroring those of Building B.
- Creating a cohesive aesthetic between both buildings regarding them as a whole.

VEGETATION SCHEDULE

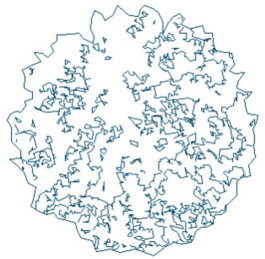
KEY PLAN



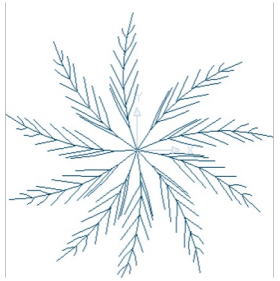
European beech

Alder

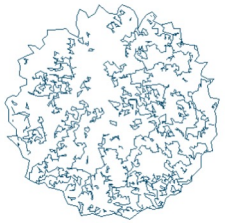
European Aspen



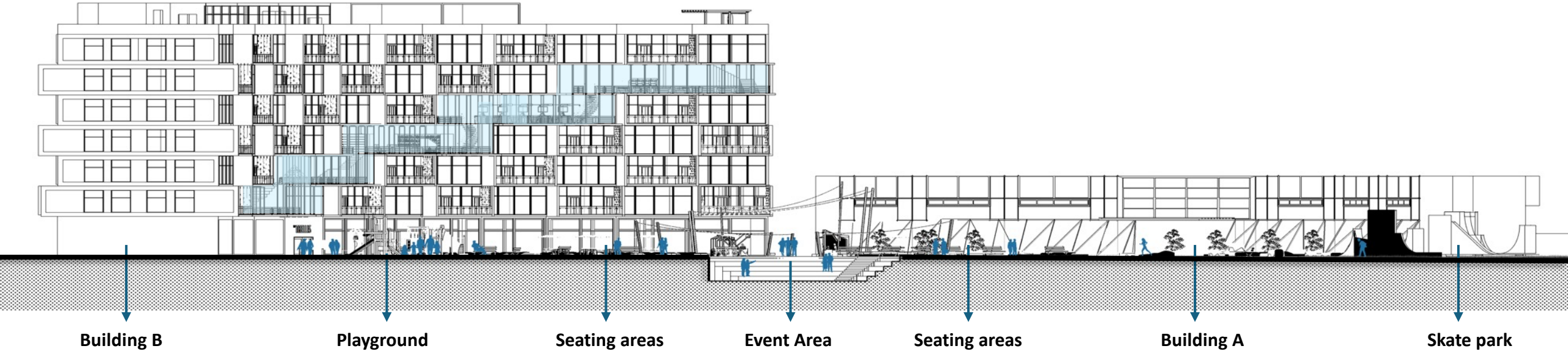
Silver birch (Betula pendula



Spruce



Lilac



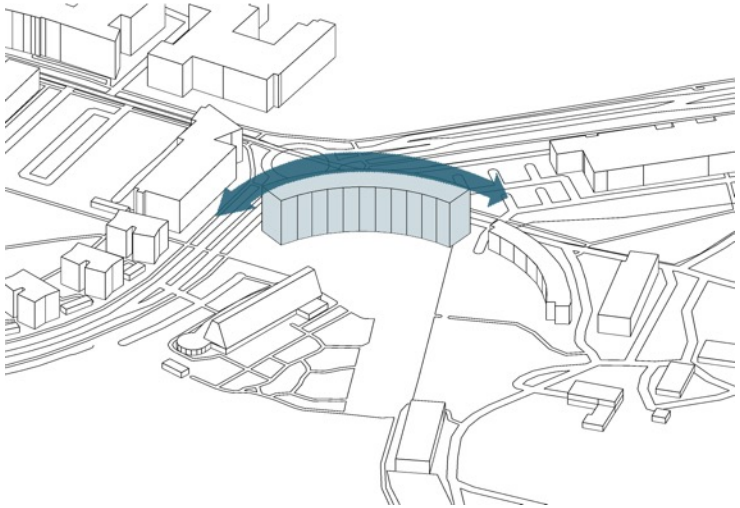
BEFORE

AFTER

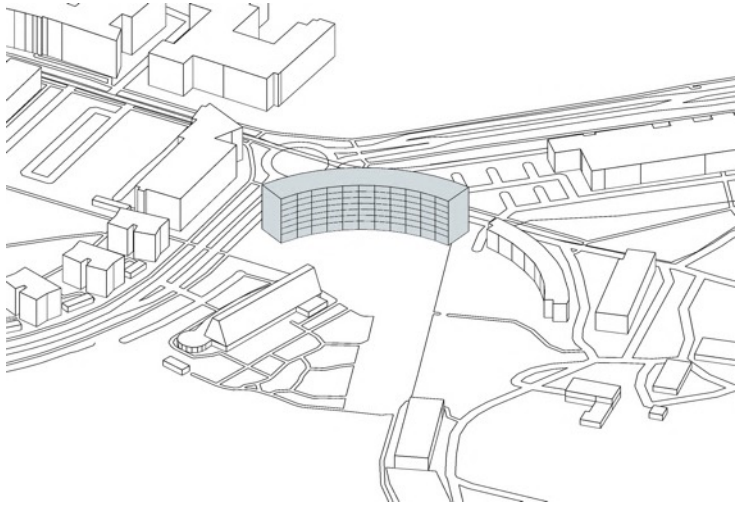
THE TRELLIS

- Inspired by the elegance of a trellis, featuring a dynamic diagonal void reminiscent of a garden lattice.
- Seamlessly integrates nature into the interior, forging a strong link between the building and urban surroundings.
- It's a deliberate move to blend the structure with the larger ecosystem, fostering community engagement and connectivity.

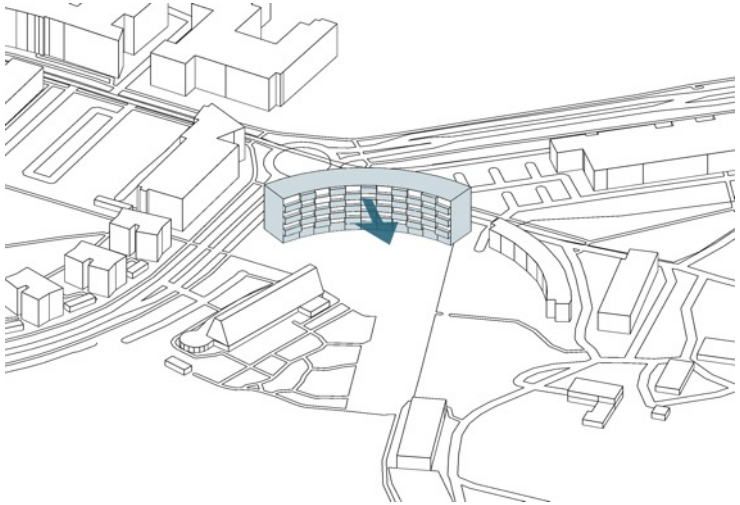
FORM DEVELOPMENT



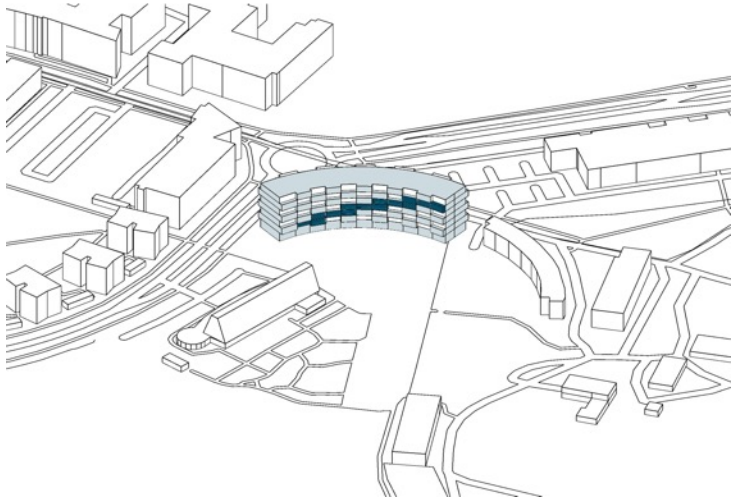
MATCHING THE AXIS
Following the curve matching the geometry of site.



CREATION OF LATTICE
Incorporation of grid lattice onto the built form.



CREATION OF VOIDS
Creation of voids by pushing and pulling of units maximizing views and creation of interesting facade.



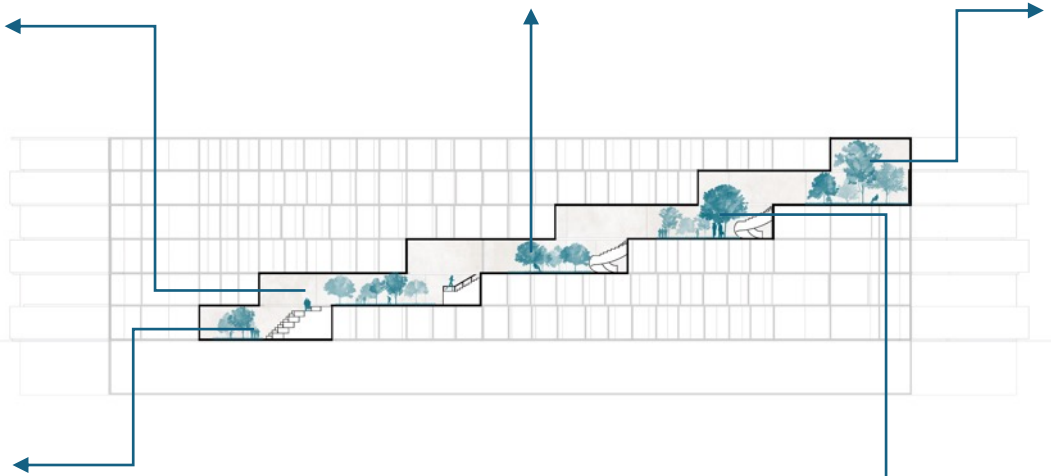
DIAGONAL VOID
Diagonal voids are strategically positioned to mimic the intricate lattice patterns of trellises.

DIAGONAL VOID

3rd Floor
READING NOOKS

2nd Floor
KIDS PLAY AREA

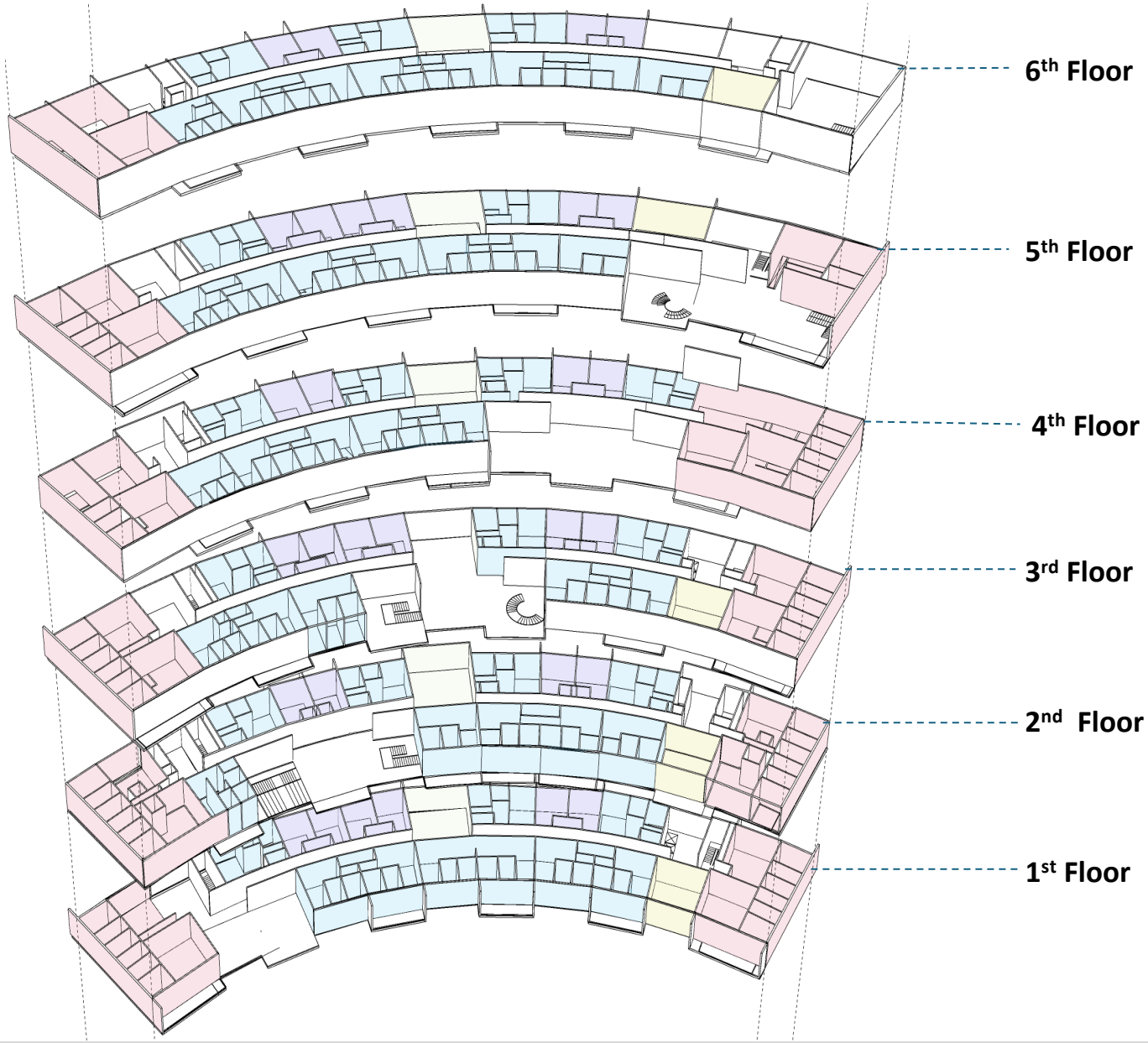
5th Floor
GAMES AREA



1st Floor
INDOOR GARDEN/SEATING AREA

4th Floor
VR AREA

APARTMENT ZONING



3 BEDROOM

2 BEDROOM

STUDIO

LAUNDRY

LOUNGE

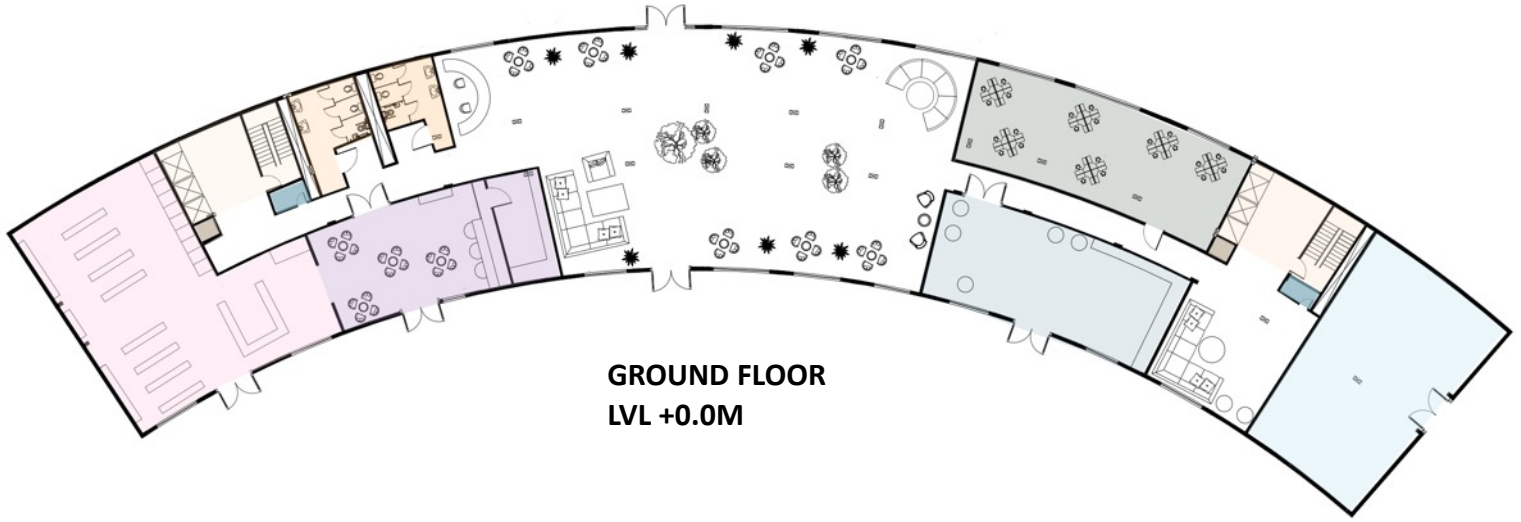
Studios
34 units

2 bedrooms
45 units

3 bedrooms
21 units

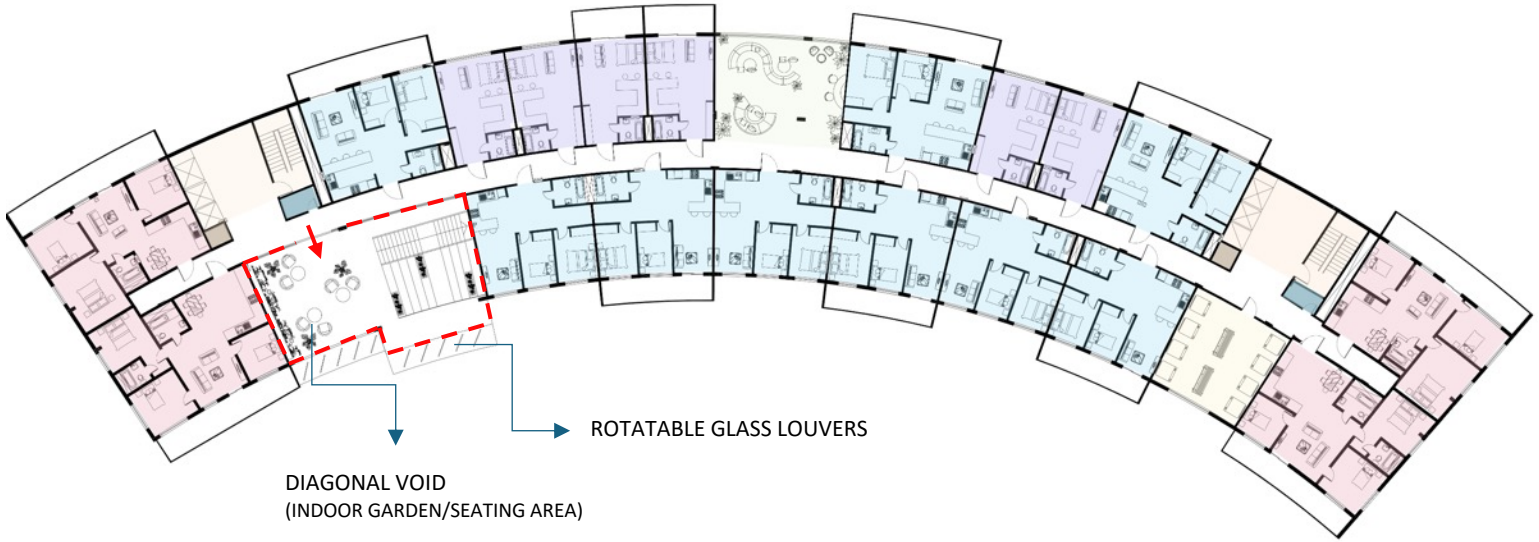
FLOOR PLANS

KEY PLAN



GROUND FLOOR
LVL +0.0M

- RETAIL STORE
- SERVICE CORE
- CAFE
- WORKSHOPS
- PET STORE
- WASTE MANAGEMENT
- MECHANICAL ROOM
- WASHROOMS
- BIKE ROOM



FIRST FLOOR
LVL +12.0M

- 3 BEDROOM (4)
- 2 BEDROOM (9)
- STUDIO (6)
- LAUNDRY
- LOUNGE

FLOOR PLANS

KEY PLAN

SECOND FLOOR
LVL +8.5M

- 3 BEDROOM (4)
- 2 BEDROOM (9)
- STUDIO (6)
- WASTE MANAGEMENT
- MECHANICAL ROOM
- LAUNDRY
- LOUNGE

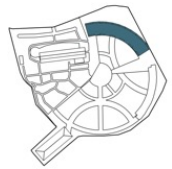
THIRD FLOOR
LVL +12.0M

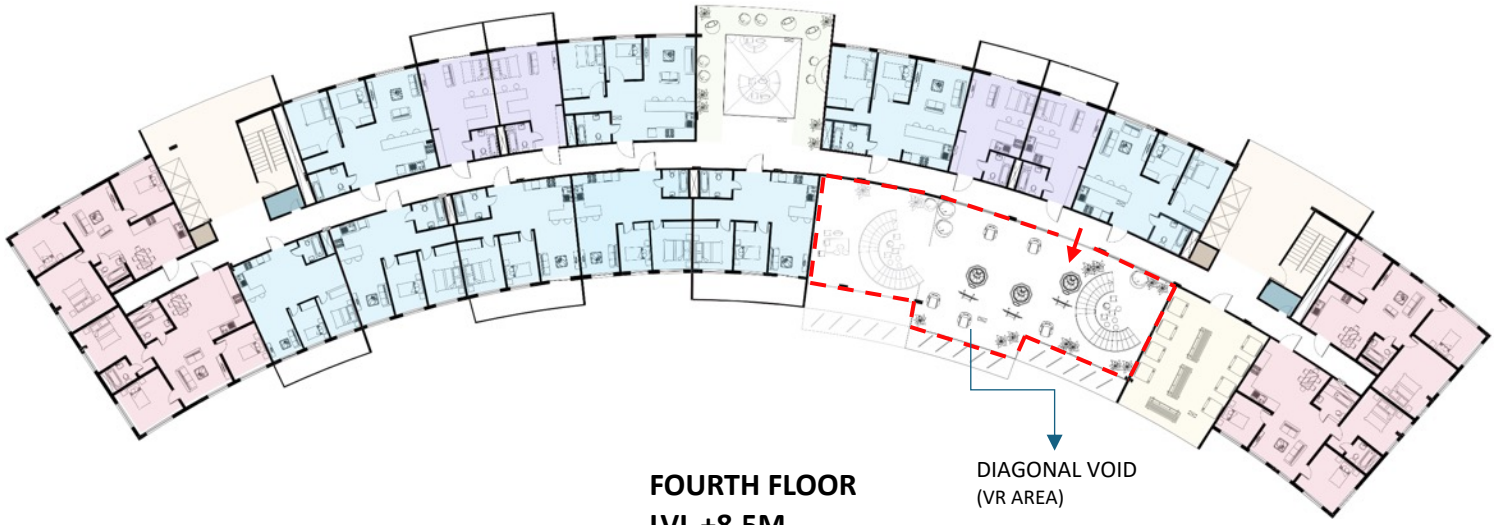
- 3 BEDROOM (4)
- 2BEDROOM(9)
- STUDIO (6)

0 1:200 10m

FLOOR PLANS

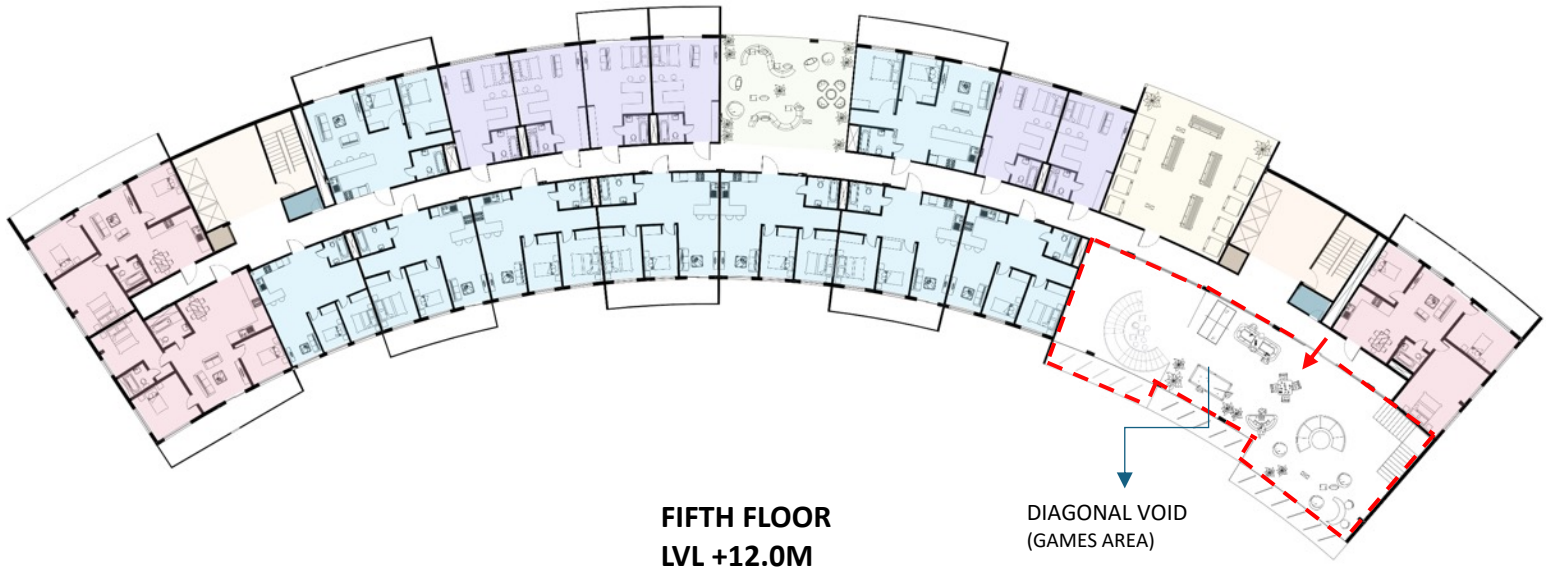
KEY PLAN





FOURTH FLOOR
LVL +8.5M

- 3 BEDROOM (4)
- 2 BEDROOM (9)
- STUDIO (4)
- WASTE MANAGEMENT
- MECHANICAL ROOM
- LAUNDRY
- LOUNGE



FIFTH FLOOR
LVL +12.0M

- 3BEDROOM (3)
- 2BEDROOM (9)
- STUDIO (6)

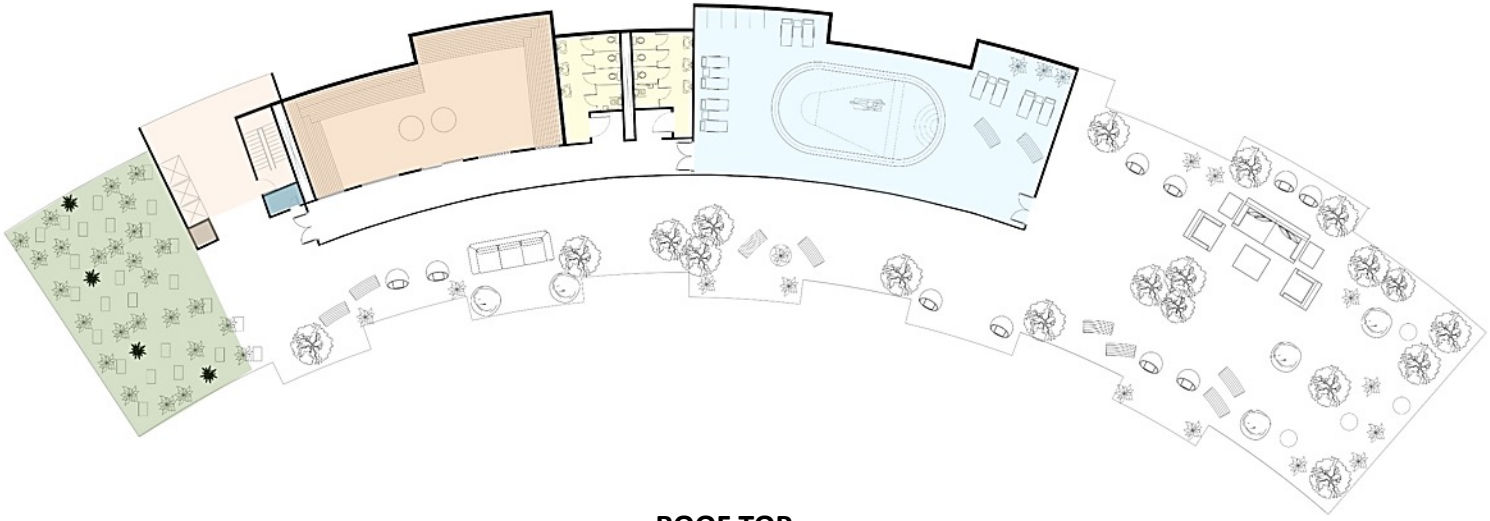
0 1:200 10m

FLOOR PLANS

KEY PLAN

SIXTH FLOOR
LVL +8.5M

- 3 BEDROOM (2)
- 2 BEDROOM (9)
- STUDIO (6)
- WASTE MANAGEMENT
- MECHANICAL ROOM
- LAUNDRY
- LOUNGE



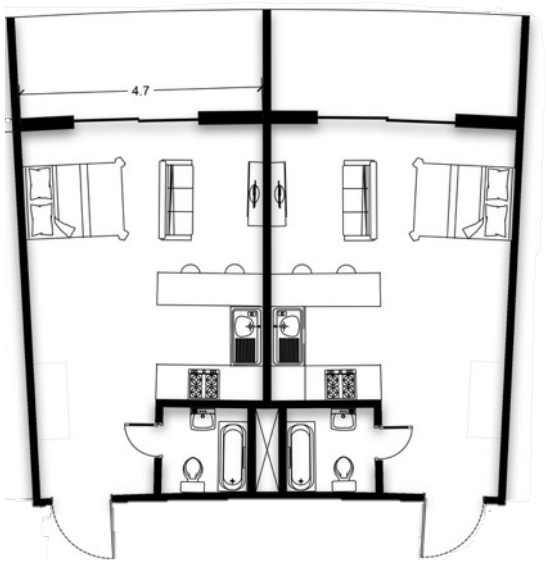
ROOF TOP
LVL +12.0M

- ROOF GARDEN (4)
- SKY SAUNA (8)
- WASHROOMS (6)
- INDOOR POOL

0 1:200 10m

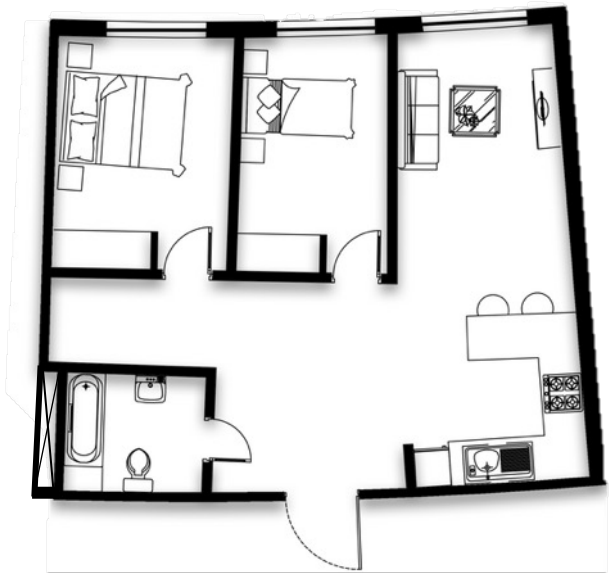
STUDIO UNIT

34 Units



TWO BEDROOM UNIT

45 Units

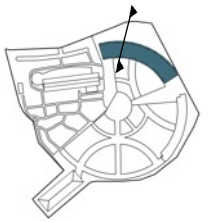


THREE BEDROOM UNIT

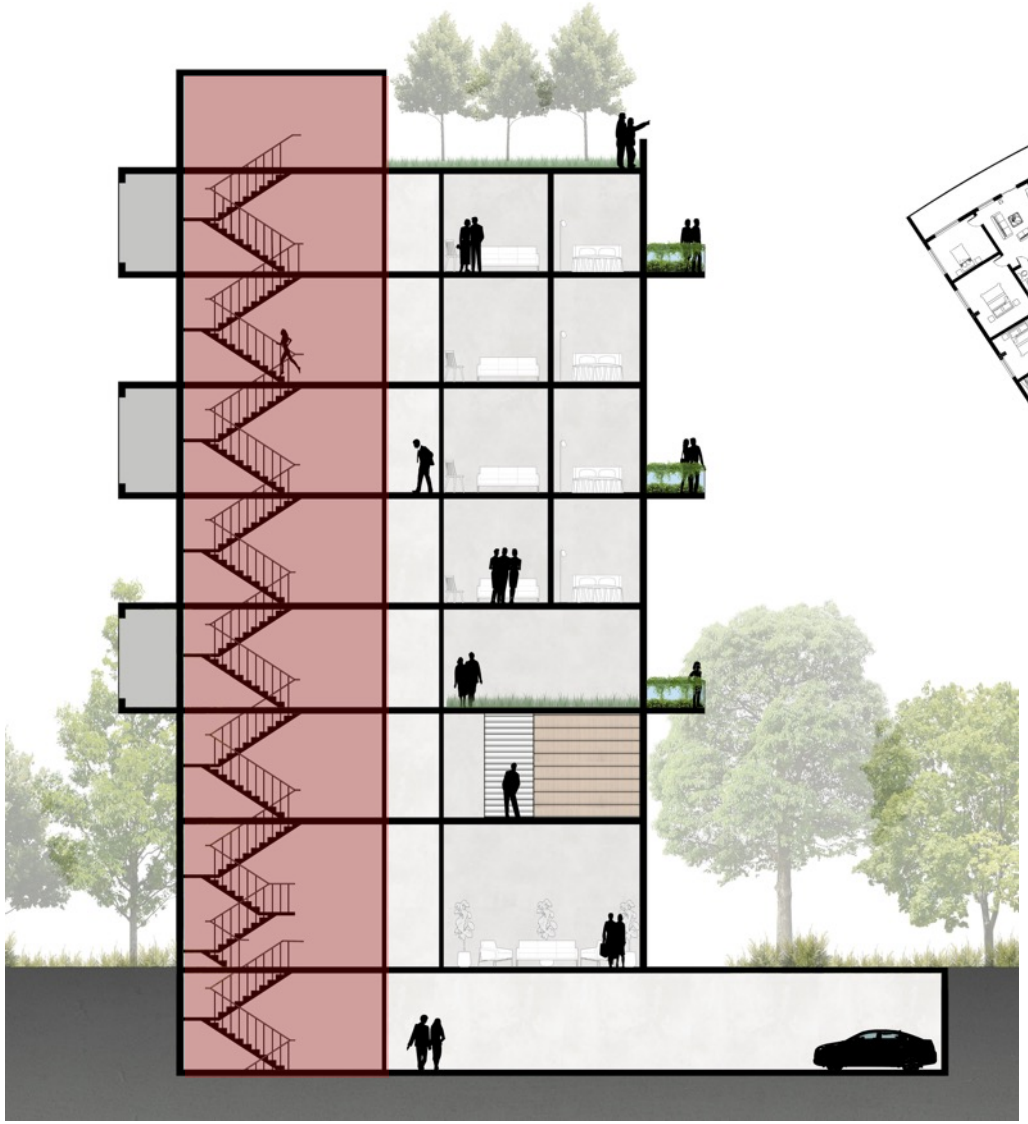
21 Units

FIRE EVACUATION

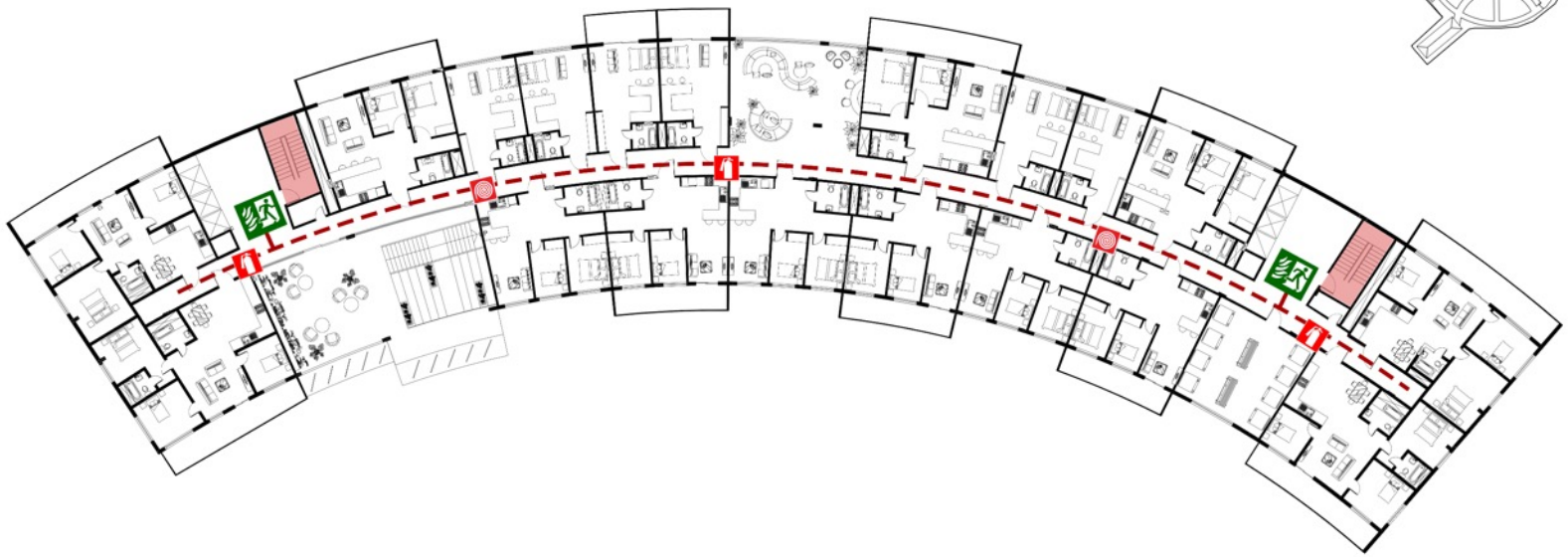
KEY PLAN



FIRE EVACUATION SECTION



FIRE EVACUATION PLAN



LEGEND

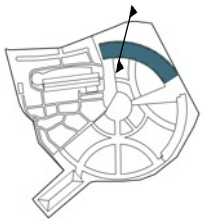
- FIRE STAIRCASE
- FIRE EXIT
- FIRE HOSE
- FIRE EXTINGUISHER

Gyproc SAINT-GOBAIN

Gyproc Fire Resistant Wall System:
This non-loadbearing system provides high performance fire resistance, with a fire rating of up to **120 minutes.**

PRODUCTS USED

KEY PLAN



SAINT-GOBAIN

Ecophon
SAINT-GOBAIN

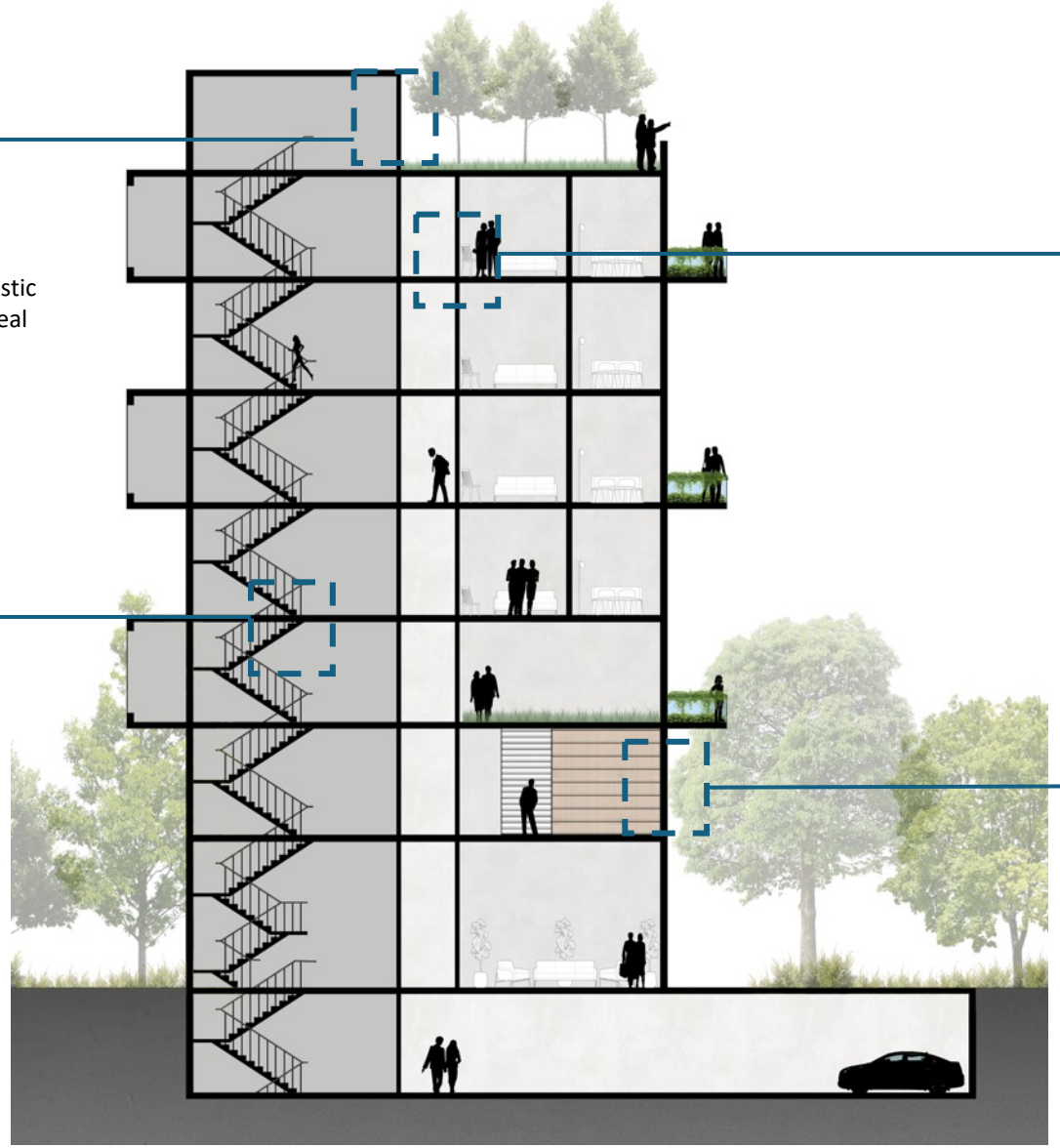
ACOUSTIC INSULATIONS

Ecophon Akusto: Moisture-resistant acoustic panel with excellent sound absorption, ideal for high humidity environments like swimming pools, changing rooms.

Gyproc
SAINT-GOBAIN

GYPSUM BOARDS

GYPROC GL 15 LAPIKAS: Fiberglass-reinforced gypsum board for floor structures, featuring durable multi-layer cardboard coating on both sides.



weber
SAINT-GOBAIN

WATERPROOFING

WEBER 130 CORE: Pumpable, fiber-reinforced cement screed for floating, heated, and sound-insulating floors. Also ideal for levelling concrete and underground floors in residential buildings.

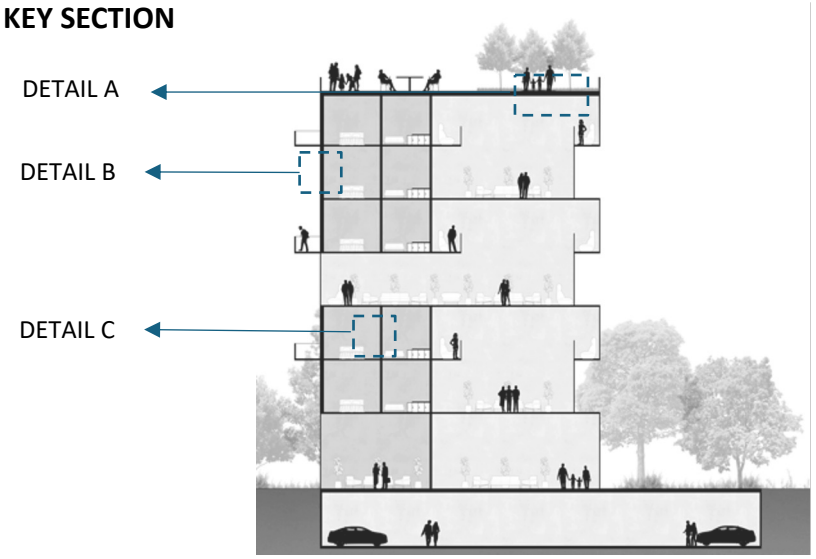
ISOVER
SAINT-GOBAIN

THERMAL INSULATION

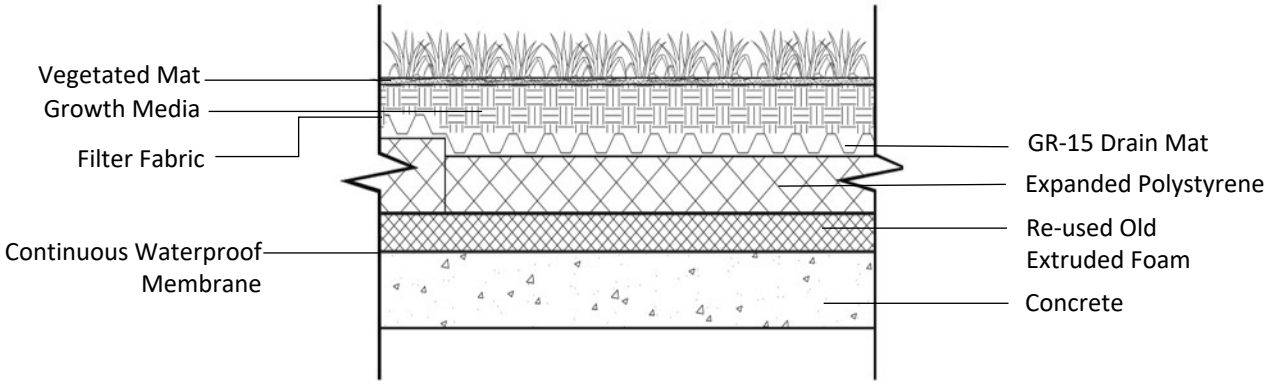
ISOVER PREMIUM 33: Uncoated glass wool insulation with high R-value and corrosion-resistant composition.

TECHNICAL DETAILS

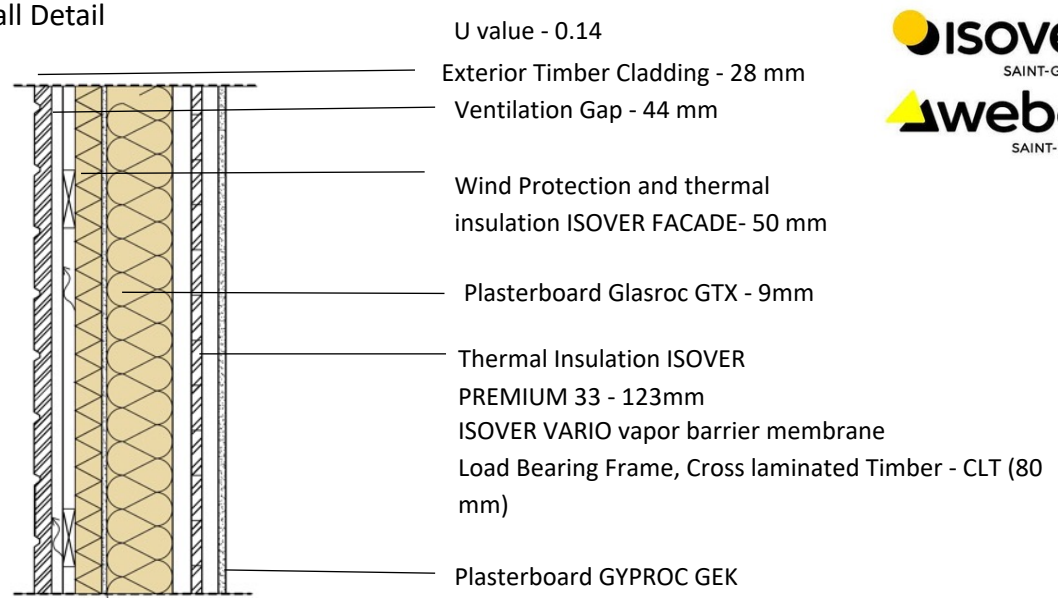
KEY SECTION



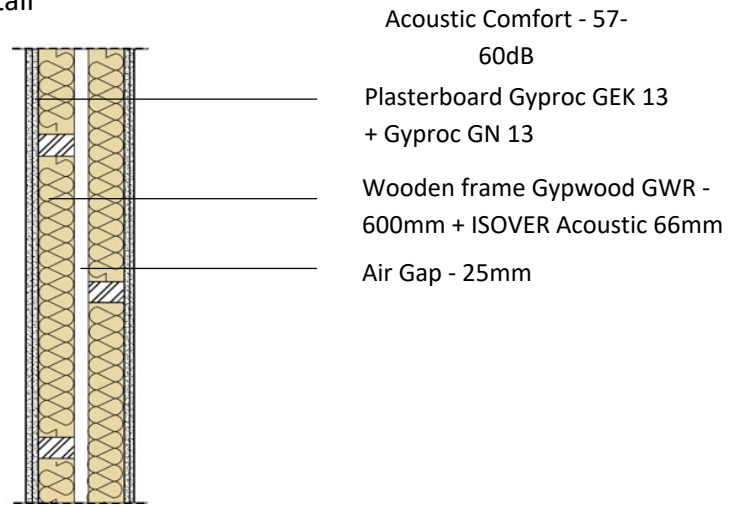
DETAIL A
Green roof Detail



DETAIL B
Exterior Wall Detail

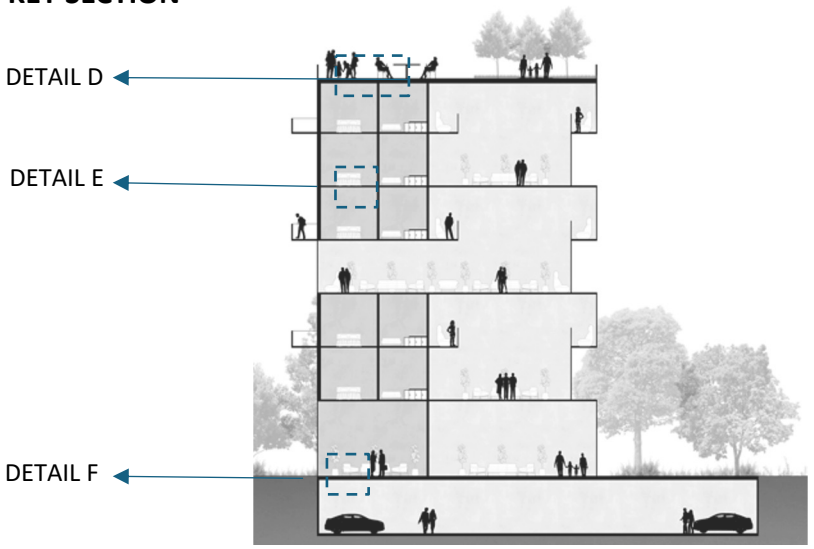


DETAIL C
Interior Wall Detail



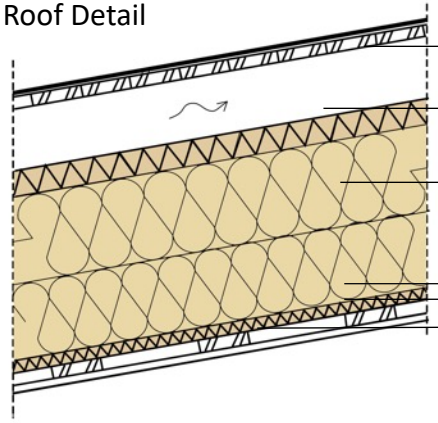
TECHNICAL DETAILS

KEY SECTION



DETAIL D

Roof Detail



Ventilated Air space

Wind Protection and Therma Insulation ISOVER RKL-31.

Sheet wool ISOVER PREMIUM

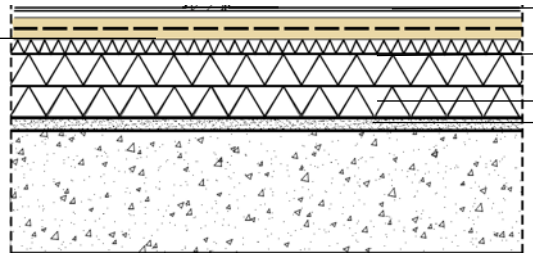
ISOVER Vapour barrier

Sparse board

Plasterboard GYPROC GN

DETAIL F

Ground Floor Detail



Weber floor CORE Comfort Plaano

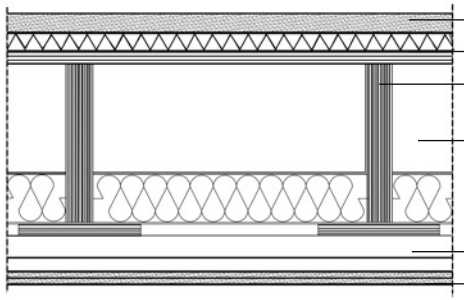
Waterproofing and tiling

Weber floor fiberglass mesh

Weber floor comfort boards Polystyrene Insulation

DETAIL E

Floor Detail



Weberveton 130 CORE Comfort Plano-40mm

ISOVER ALU FLO – 30mm

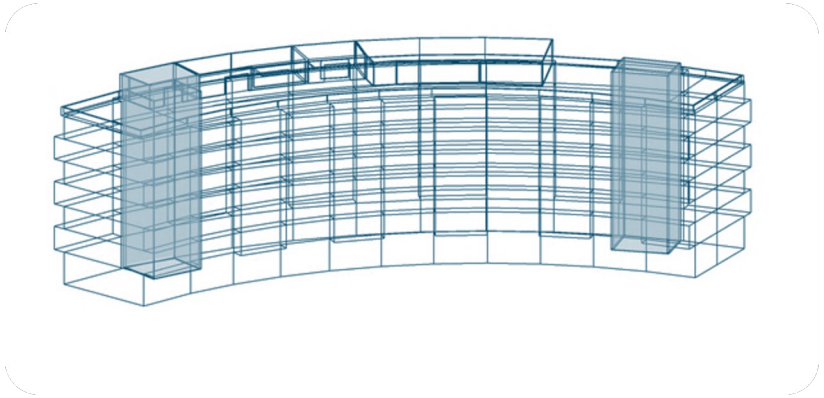
Plywood 25mm

Between soft mineral wool ISOVER acoustic

Acoustic spring frame Gyproc – 25mm

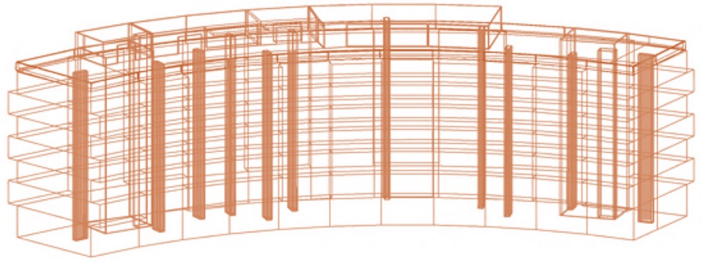
Plasterboard GYPROC GN – 15mm

BUILDING SERVICES



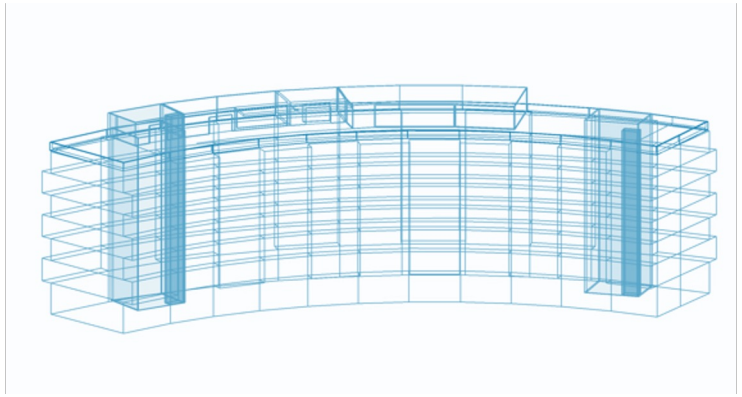
VERTICAL TRANSPORTATION

The building features two service cores running along its length, each equipped with a flight of stairs, two passenger lifts, and one service lift for accessing higher floors.



MECHANICAL CORES

The building's duct system ensures the safeguarding of cables and utility pipes throughout its infrastructure.

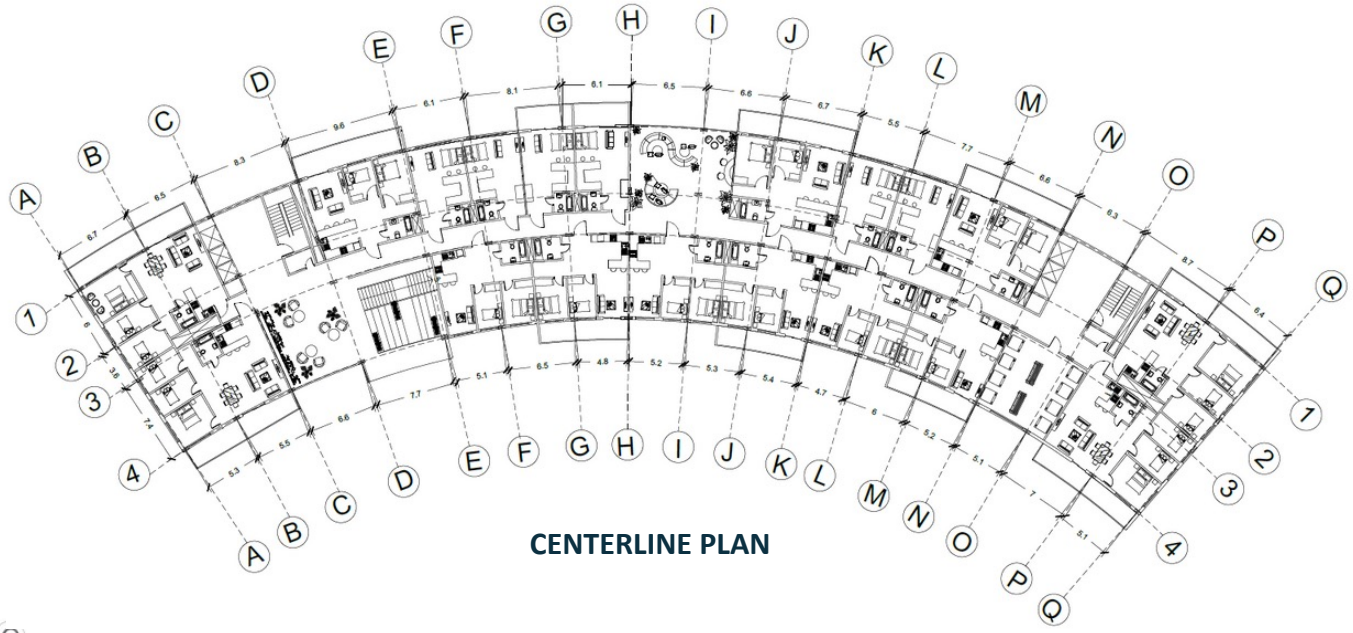


WASTE MANAGEMENT

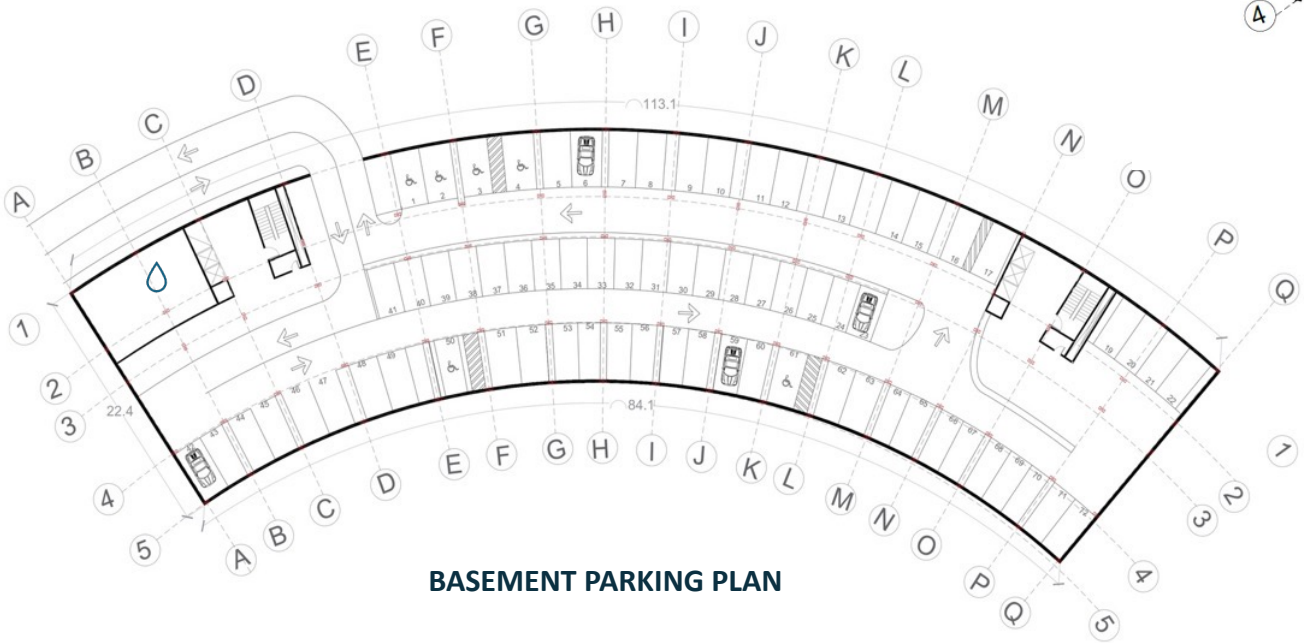
Each building core features a garbage chute for easy waste disposal, keeping things clean and practical.

STRUCTURAL SYSTEM

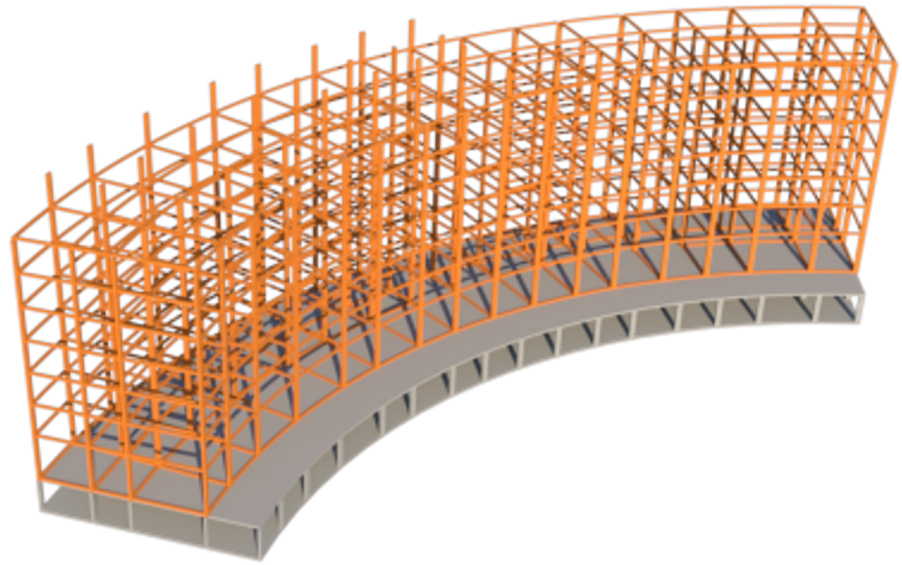
- Load bearing members (Columns and beams) – Glu Laminated timber GLT.
- Slabs and walls – Cross Laminated Timber.
- Slabs, columns and beams of basement made up of reinforced concrete.



CENTERLINE PLAN



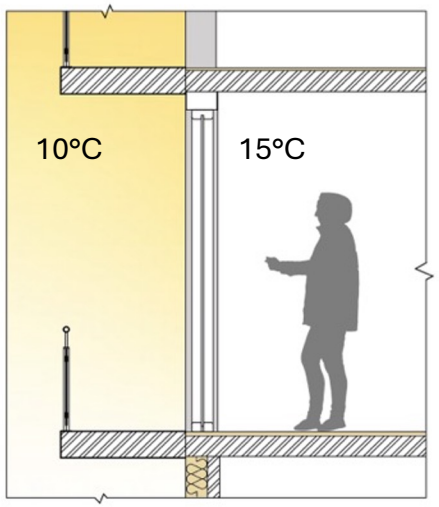
BASEMENT PARKING PLAN

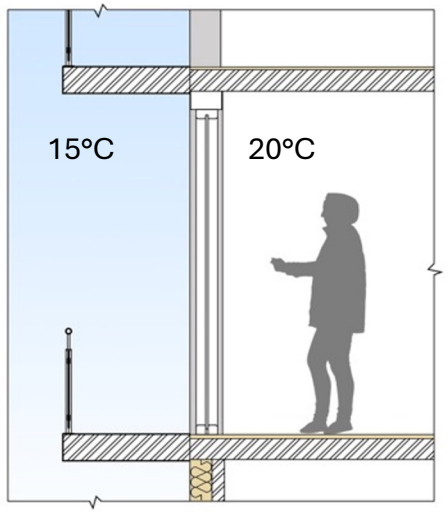


Total number of parking spaces - 72

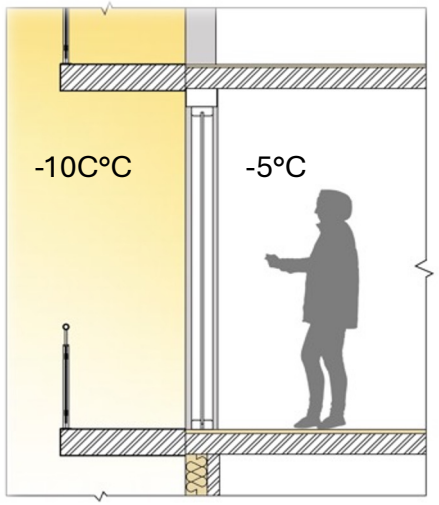
Water Purification pump.

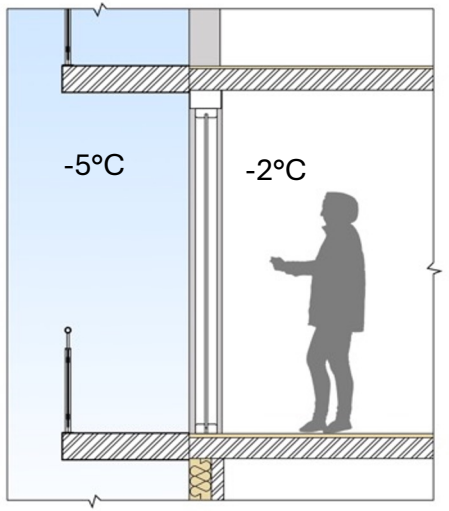
THERMAL COMFORT





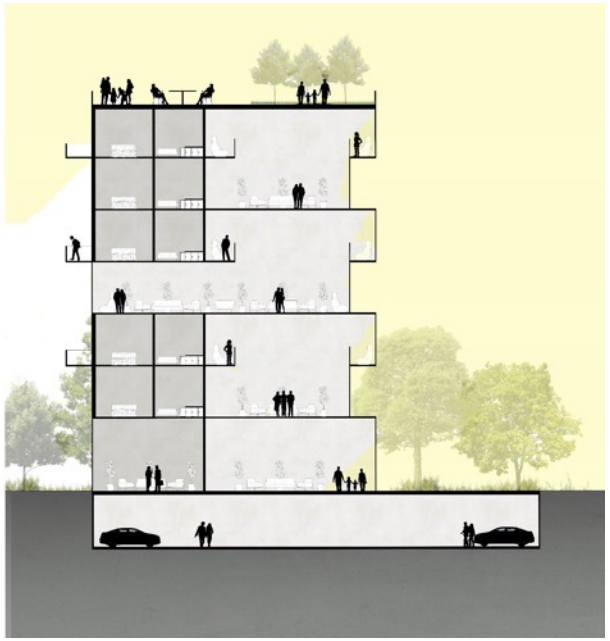
SUMMER



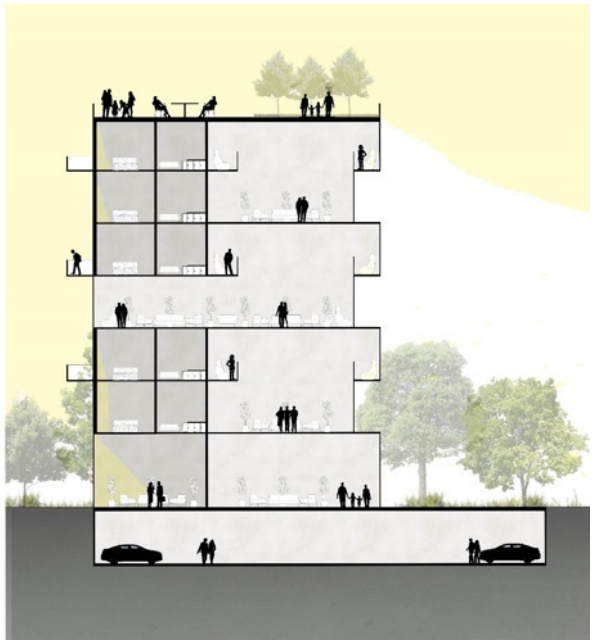


WINTER

VISUAL COMFORT



Morning Sun



Evening Sun

Considerations for Better Visual Comfort

- **Location of building**: Maximizing daylight, Bringing in natural light into spaces, creating well-lit and inviting spaces that enhance occupants' well-being strategically.
- **Window Placement**: The layout considers the placement of windows strategically, capturing views of the surrounding nature.
- **Green spaces** designed on each floor attract the eye of residents and external people.

Light levels by Space

- Kitchen- 500-1000 Lux
- Living room- 300 Lux
- Bedroom-300 Lux
- Dining room- 200-500 Lux
- Bathroom-200 Lux
- Corridor- 50 Lux

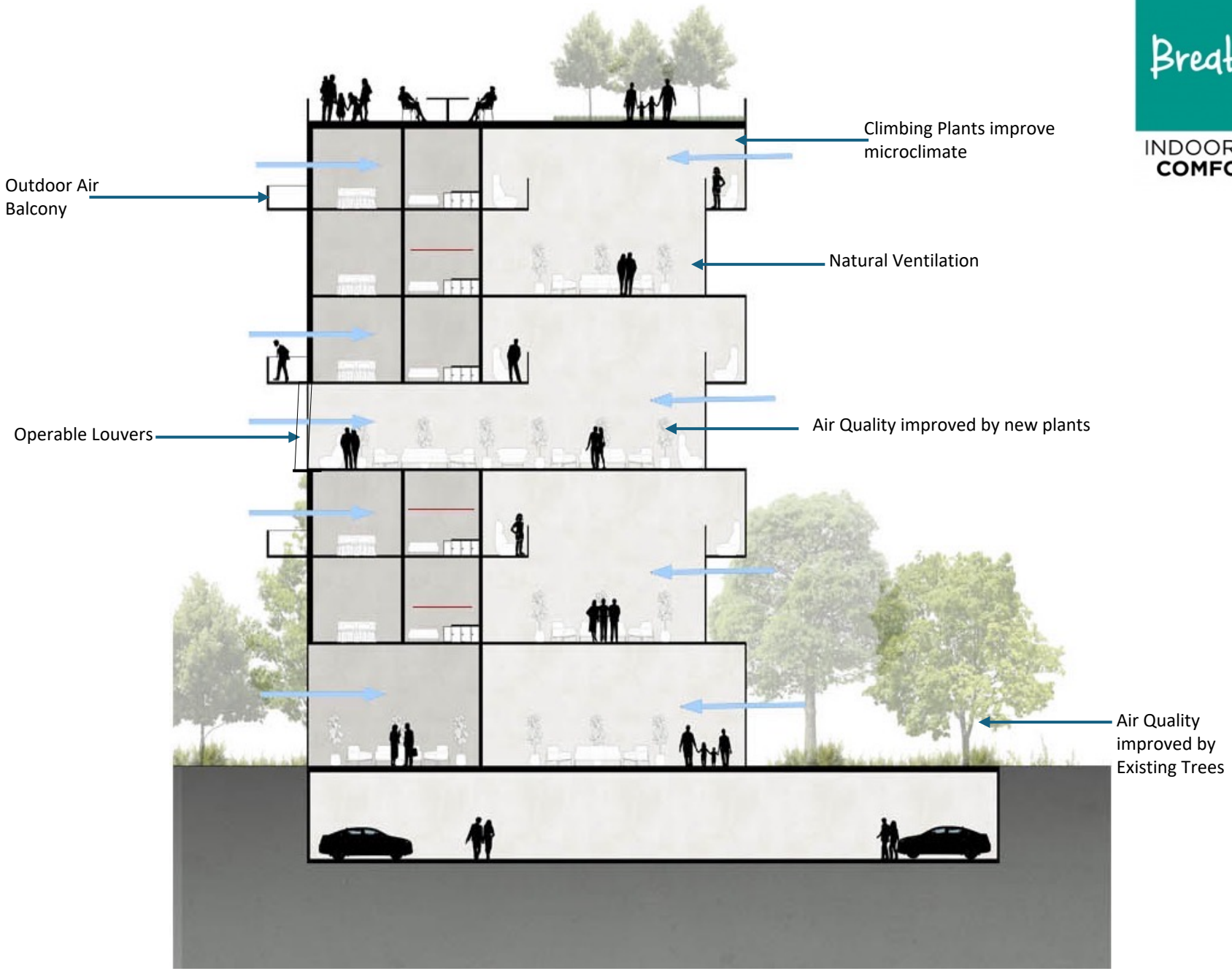
KEY PLAN

INDOOR AIR COMFORT

Breathe
INDOOR AIR COMFORT

Considerations For Better Indoor Air Comfort

- Natural ventilation techniques that let residents open their doors and windows to let in fresh outdoor air.
- Adding indoor plants to enhance the quality of the air and green roofs eliminating major indoor contaminants.
- High levels of insulation and well-ventilated spaces.
- Operable glass louvers placed can be tilted or opened to varying degrees, allowing control over ventilation.

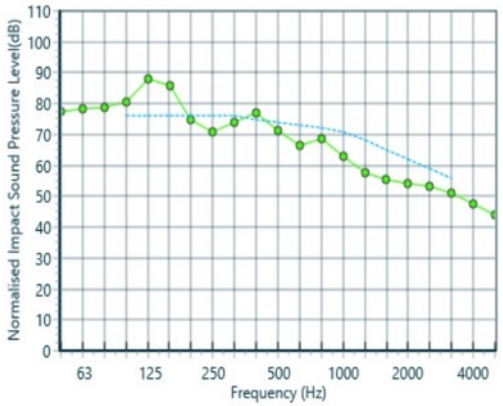


ACOUSTIC COMFORT

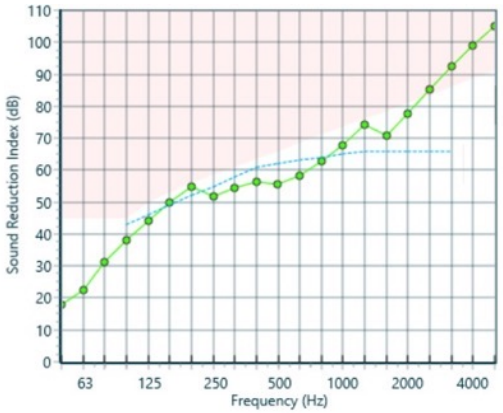
Considerations For Better Acoustic Comfort

- By reducing noise transmission within buildings, acoustic comfort insulation solutions attempt to improve the privacy and well-being of building occupants.
- It helps reduce impact and airborne noise, creating a more peaceful and quieter interior atmosphere.

Insul Software



Flooring
Ln,w - 74dB

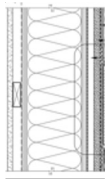


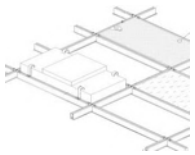
Exterior Wall
Rw - 62dB

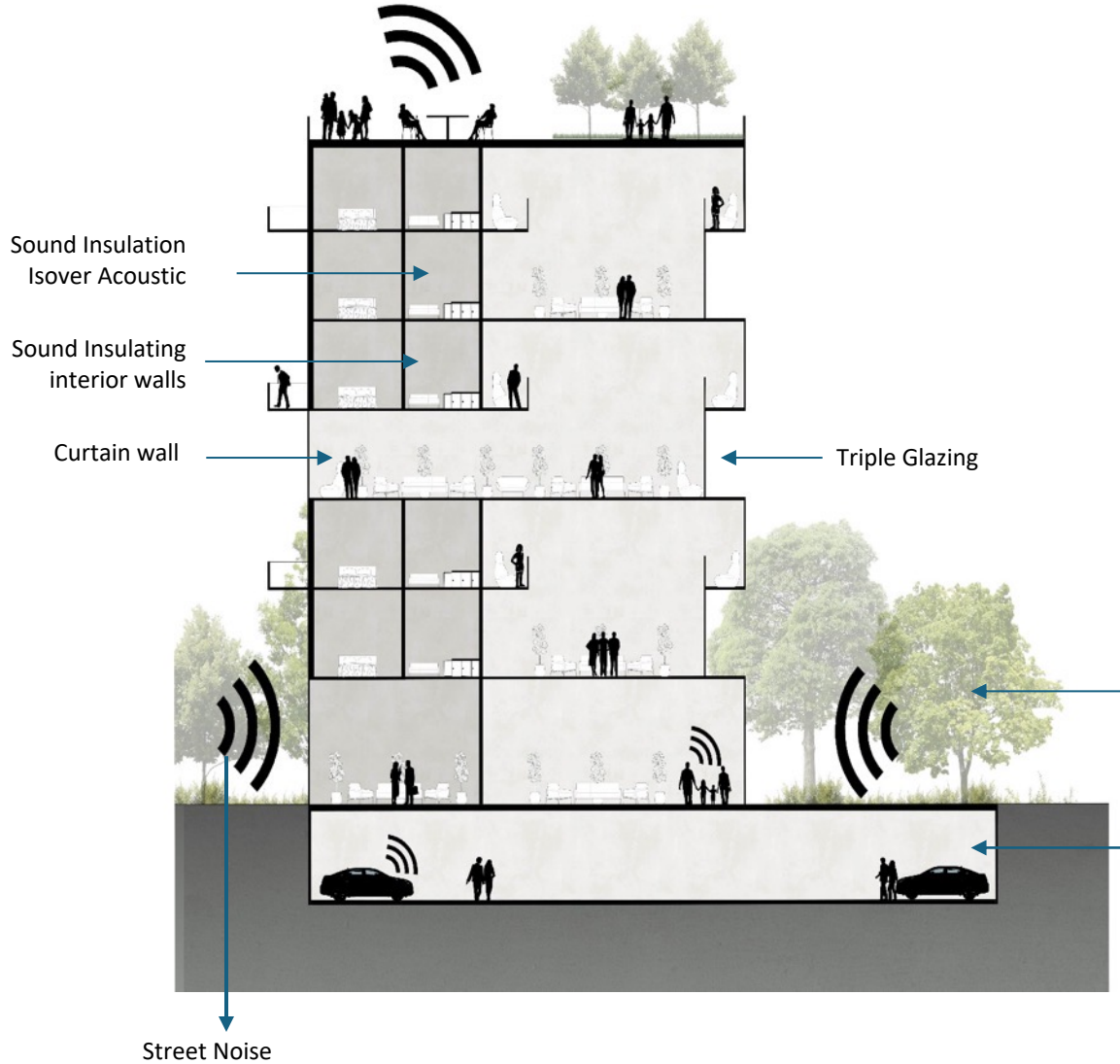
INSUL

Diagrams showing the amount of sound insulation used inside the space to minimize noise coming from the nearby source outside (the tramline).

Acoustic Comfort is given in :

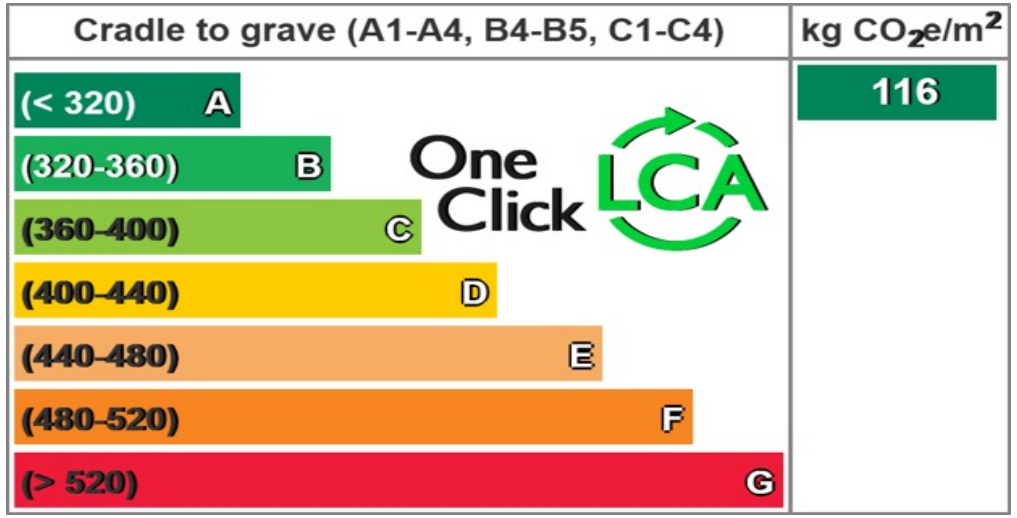



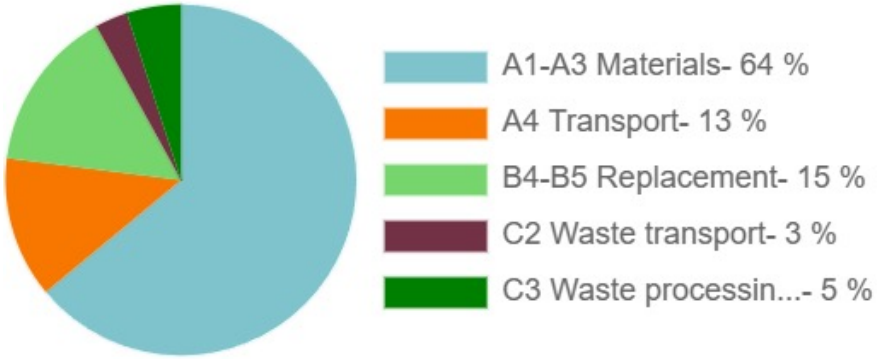


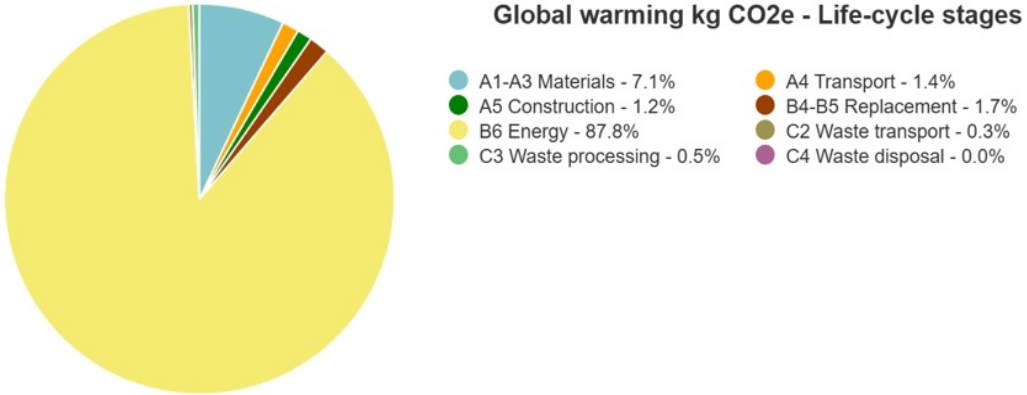


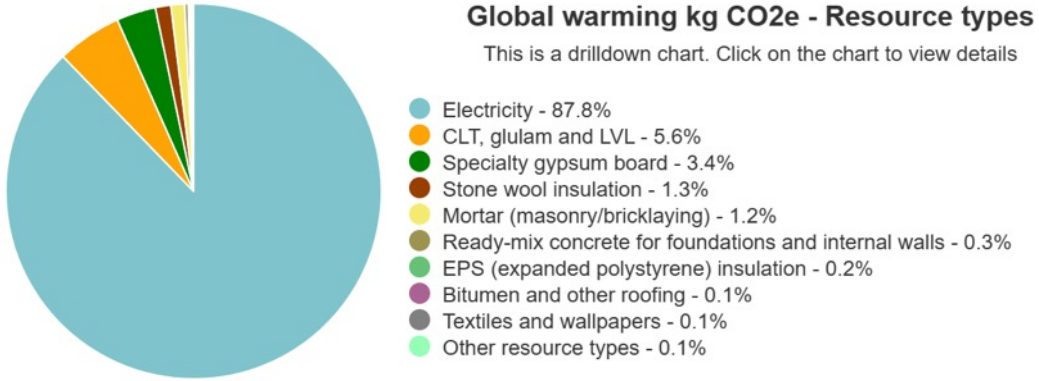
Hear
ACOUSTIC COMFORT
isover SAINT-GOBAIN
weber SAINT-GOBAIN
SAINT-GOBAIN

CALCULATIONS









CALCULATIONS

This represents the initial energy efficiency *assessment during the design phase. To* address the higher value, we incorporate transparent solar panel windows, effectively boosting energy efficiency by 30%.

Compliance

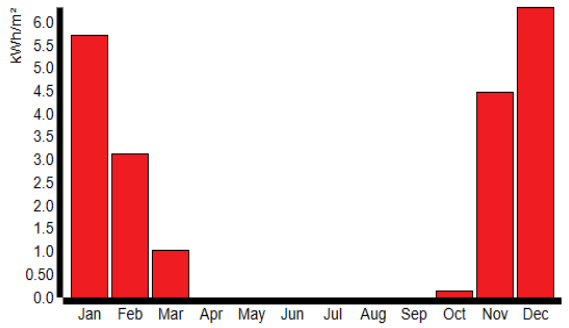
Indicator	Building [kWh/m²]	Limit value [kWh/m²]	Comply
Heating needs	20,8	15,0	No
Cooling needs	14,9	15,0	Yes

Lighting autonomy 300 Lux	Autonomy [%]	Required [%]	Comply
TZ: SPACE 1 DAYLIGHTINGCONTROLS	67,1	60.0 %	Yes
TZ: SPACE 2 DAYLIGHTINGCONTROLS	68,3	60.0 %	Yes
TZ: SPACE 3 DAYLIGHTINGCONTROLS	68,3	60.0 %	Yes
TZ: SPACE 4 DAYLIGHTINGCONTROLS	68,3	60.0 %	Yes
TZ: SPACE 5 DAYLIGHTINGCONTROLS	68,3	60.0 %	Yes
TZ: SPACE 6 DAYLIGHTINGCONTROLS	68,3	60.0 %	Yes
TZ: SPACE 7 DAYLIGHTINGCONTROLS	68,3	60.0 %	Yes

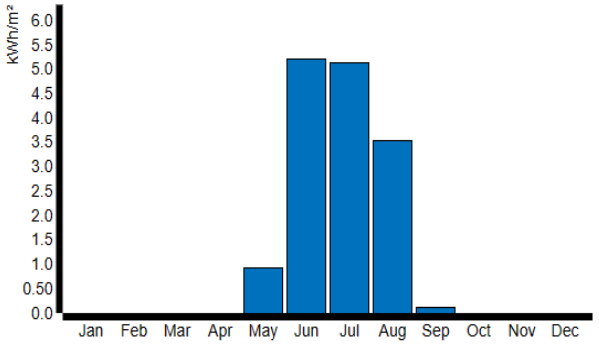
Summer comfort (overheating % of season)	Overheating [%]	Required [%]	Comply
TZ: SPACE 1	0,0	10.0 %	Yes
TZ: SPACE 2	0,0	10.0 %	Yes
TZ: SPACE 3	0,0	10.0 %	Yes
TZ: SPACE 4	0,0	10.0 %	Yes
TZ: SPACE 5	0,0	10.0 %	Yes
TZ: SPACE 6	0,0	10.0 %	Yes
TZ: SPACE 7	0,0	10.0 %	Yes

Graphs

Heating needs



Cooling needs



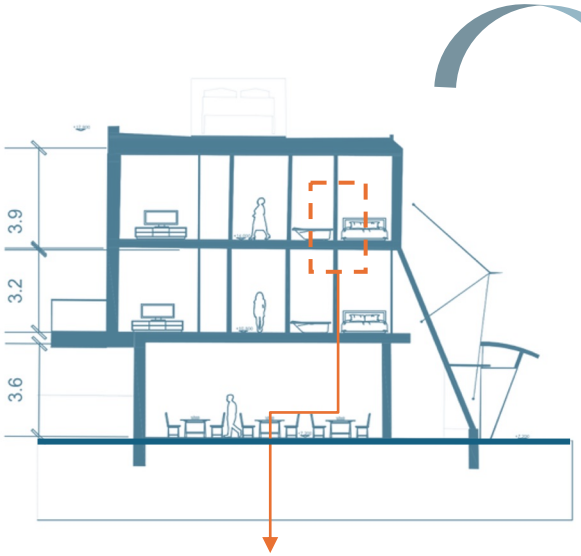
Heating needs (kWh/m²)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Heating	5,72	3,13	1,02	—	—	—	—	—	—	0,13	4,48	6,33	20,81
Total	5,72	3,13	1,02	—	—	—	—	—	—	0,13	4,48	6,33	20,81

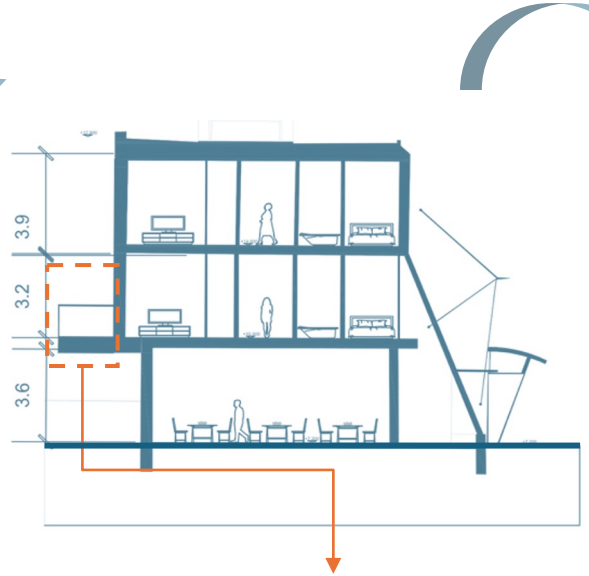
Cooling needs (kWh/m²)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Cooling	—	—	—	—	0,92	5,22	5,14	3,53	0,11	—	—	—	14,92
Total	—	—	—	—	0,92	5,22	5,14	3,53	0,11	—	—	—	14,92

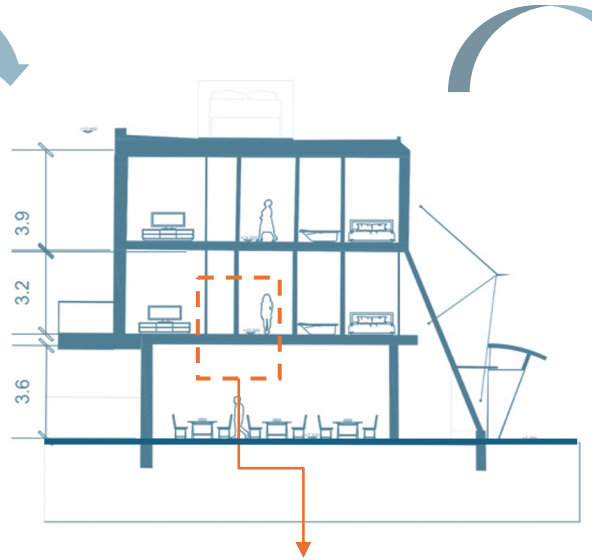
BUILDING A
RENOVATION STRATEGIES



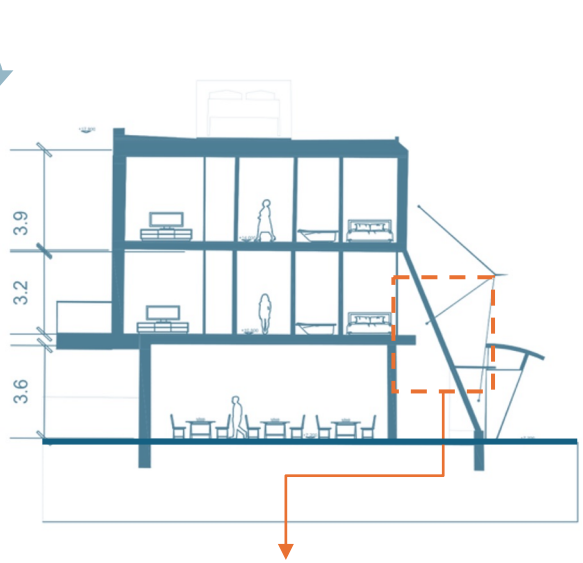
MINIMAL DEMOLITON OF INTERIOR WALLS



VOIDS RESEMBLING BUILDING B



NEW INSULATED WALLS



TRANSPARENT SOLAR GLASS

SUSTAINABLE FEATURES

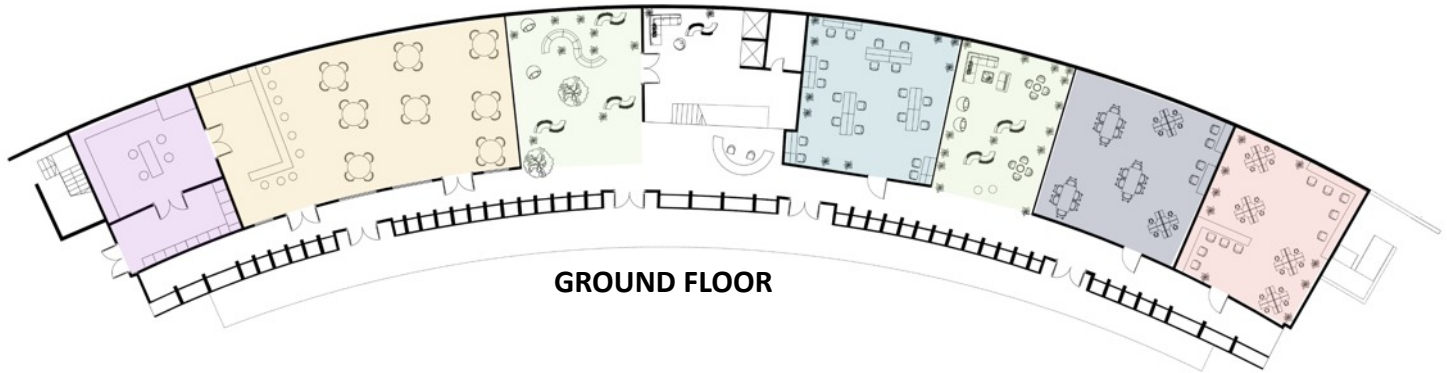
RESPECTING ORIGINAL DESIGN

MULTIPURPOSE SPACES

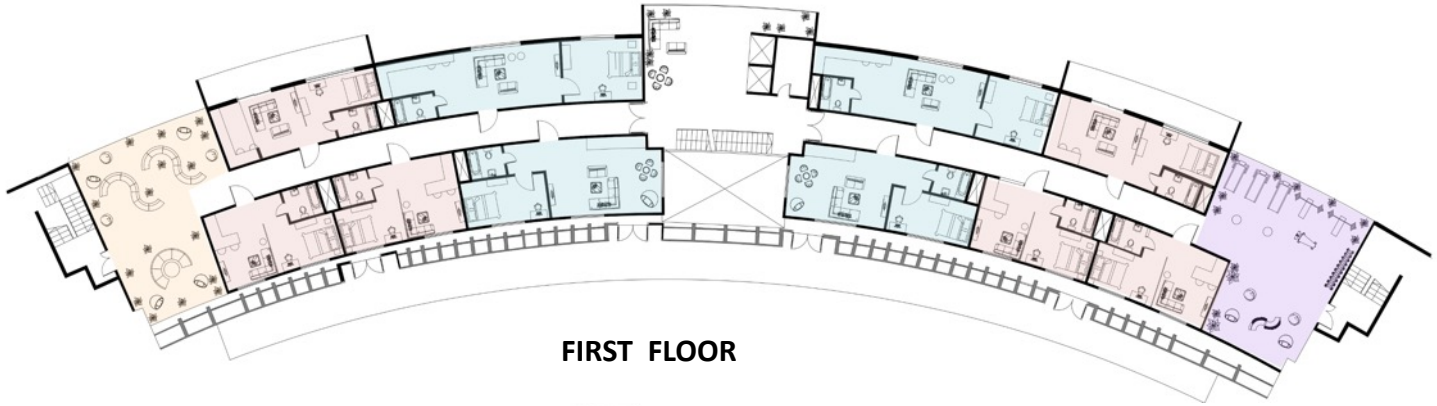
MAXIMIZING NATURAL LIGHT

INTEGRATION OF GREENERY:

BUILDING A
FLOOR PLANS



GROUND FLOOR



FIRST FLOOR

SECOND FLOOR

KEY PLAN

- KITCHEN/ STORAGE/ STAFF AREA
- CAFETERIA/BAKERY
- INDOOR GARDEN/LOUNGE
- RESEARCH LAB/ INNOVATIVE HUB
- WORKSHOP/ MEETING ROOM
- LIBRARY/STUDY PODS

- 1 BEDROOM (4)
- STUDIO (6)
- GYM
- LOUNGE

- 1 BEDROOM (4)
- STUDIO (6)
- SAUNA
- TERRACE

0 1:200 10m

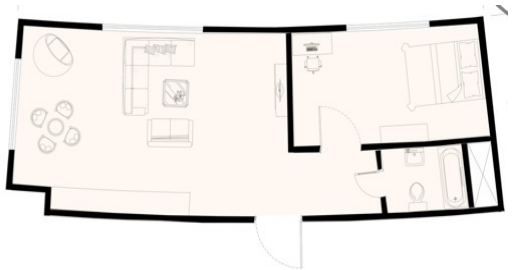
BUILDING A

INDOOR GARDEN

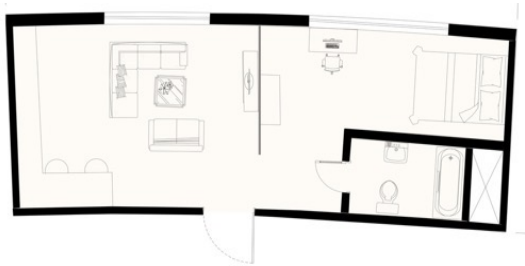
CAFE

TERRACE

HOUSING TYPOLOGIES



1 BEDROOM UNIT
8 UNITS

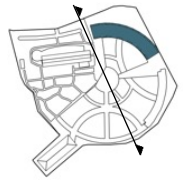


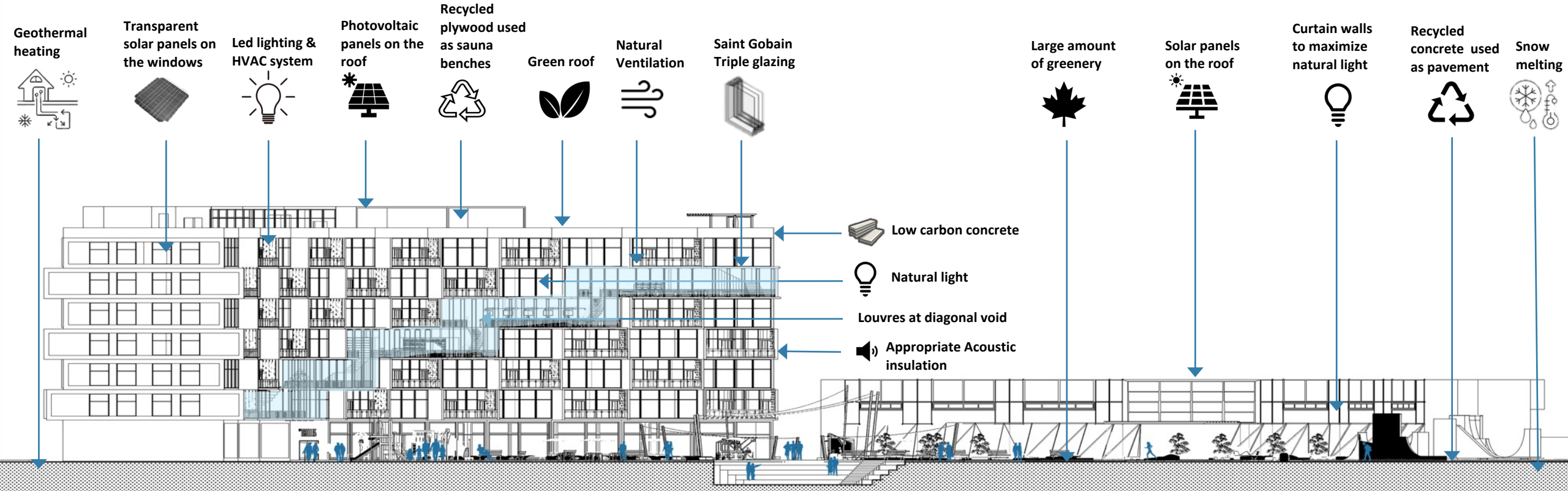
STUDIO
12 UNITS


PLACE TO EAT

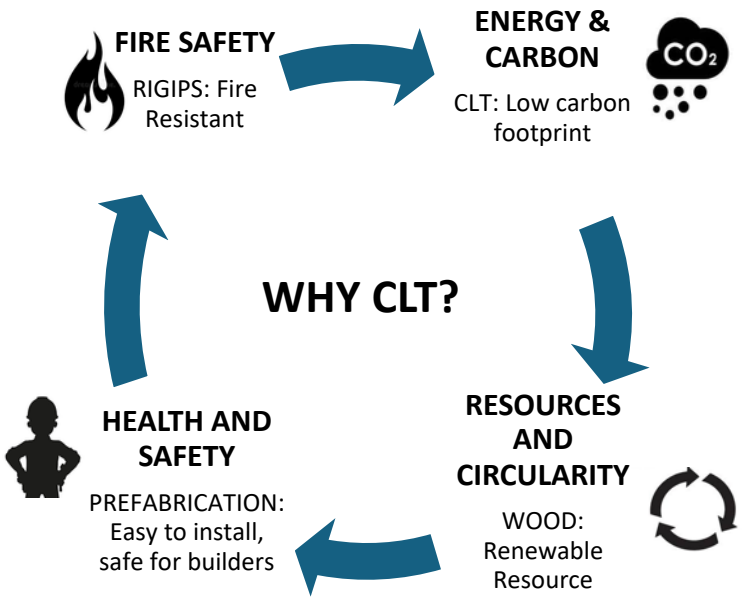
SUSTAINABLE STRATEGIES

KEY PLAN





SUSTAINABLE STRATEGIES



TRANSPARENT SOLAR PANELLED WINDOWS

- The solar windows absorb renewable energy, enhancing efficiency.
- Solar cells embedded in the glass generate electricity from sunlight.
- Built-in sensor technology optimizes energy usage and indoor comfort.
- Anticipated savings of up to 30% on building energy expenses.

SNOW MELTING SYSTEM

- It uses inground sensors to identify the presence of snow or ice.
- The pipes placed in sand, or concrete circulate a warm fluid to heat the affected area.

SOLAR PANELS

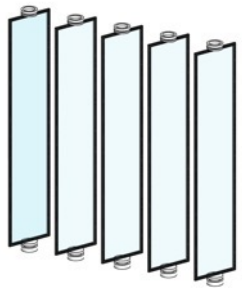
BUILDING B

- Total roof area: 590 sq.m
- Number of panels: 88
- Energy generated per panel:3.75 kWh
- Total energy generated per day: 330 kWh
- Oriented towards south

BUILDING A

- Total roof area: 590 sq.m
- Number of panels: 100
- Energy generated per panel:3.75 kWh
- Total energy generated per day: 375 kWh
- Oriented towards south

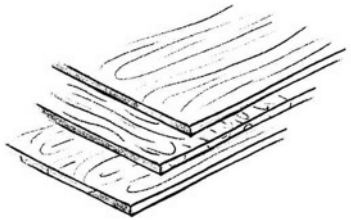
CIRCULARITY



FACADE GLASS LOUVERS

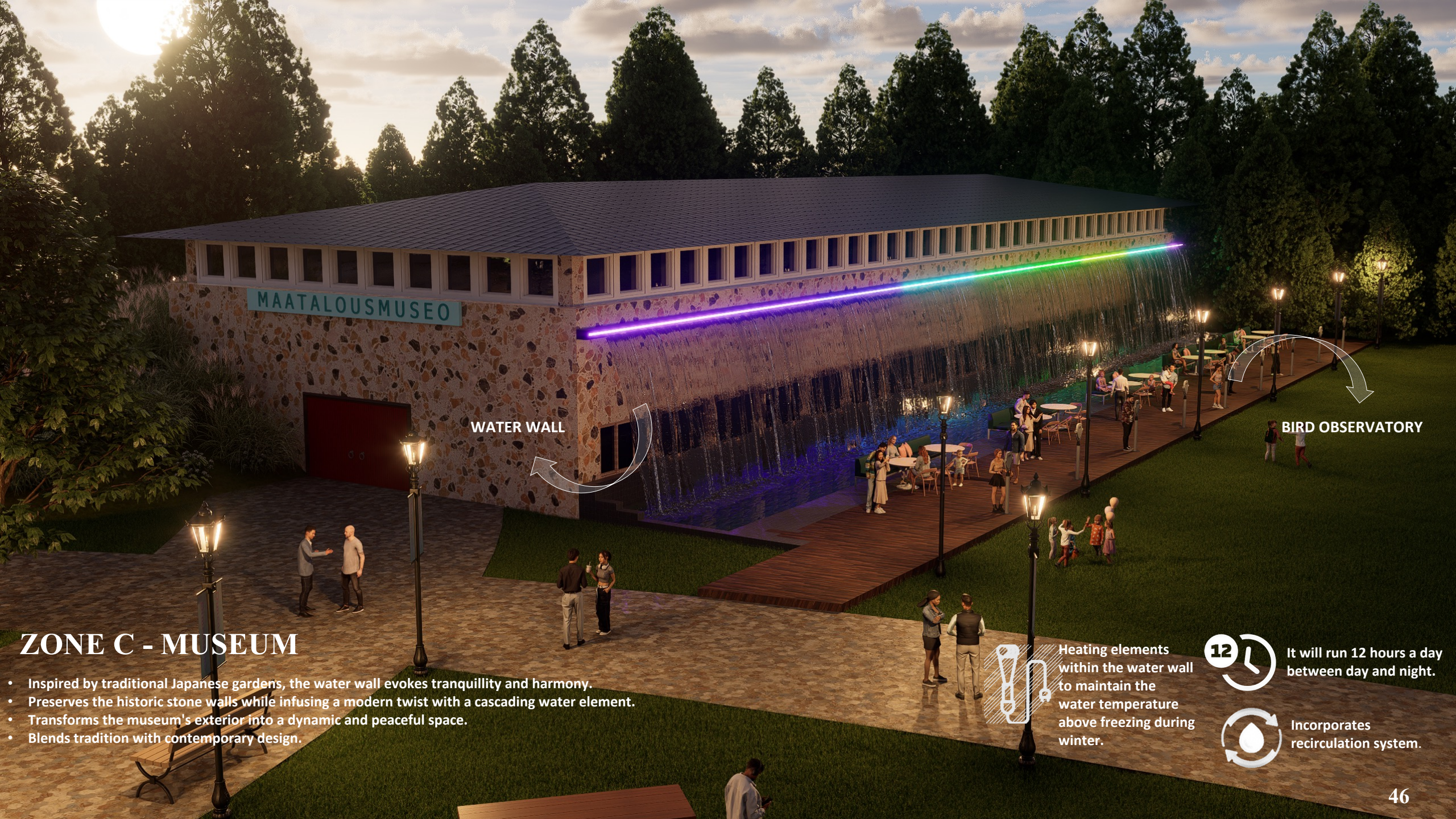
Glass recycled from the demolished building is used for vertical facade louvers.

Manually rotatable up to 180° creating ventilation channels at all seasons .



Reuse of Plywood: Materials from the demolished building is being used to create.
-Outdoor Benches
-Sauna benches
-Cup boards

Reuse of concrete: Materials from demolished building is being mixed with other materials to create pavements.



ZONE C - MUSEUM

- Inspired by traditional Japanese gardens, the water wall evokes tranquillity and harmony.
- Preserves the historic stone walls while infusing a modern twist with a cascading water element.
- Transforms the museum's exterior into a dynamic and peaceful space.
- Blends tradition with contemporary design.

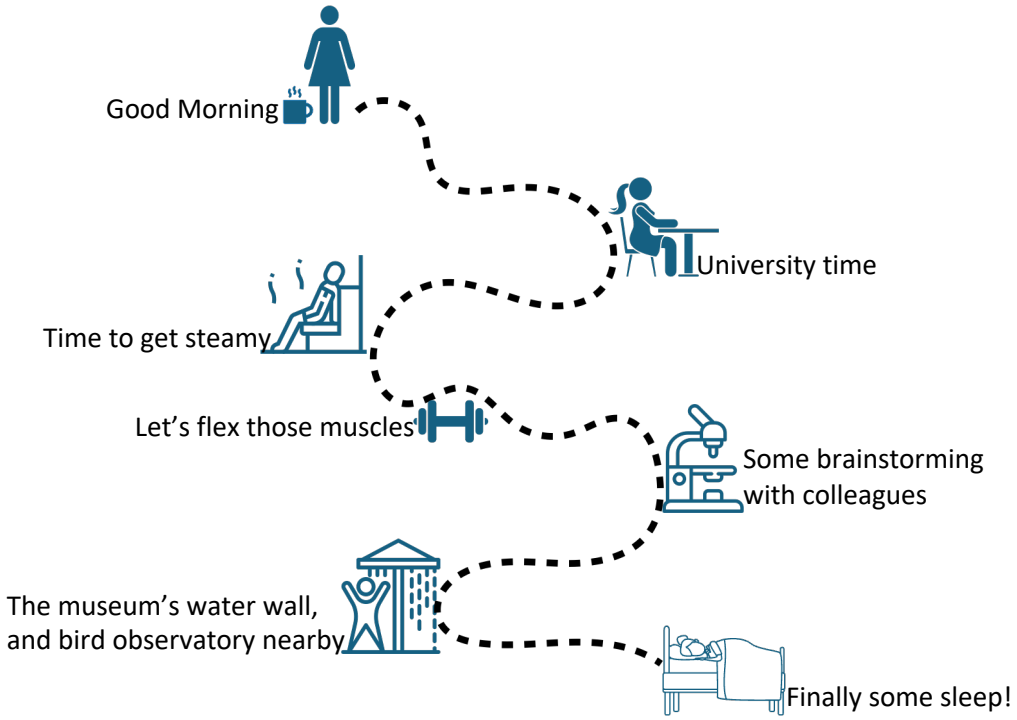
Heating elements within the water wall to maintain the water temperature above freezing during winter.

It will run 12 hours a day between day and night.

Incorporates recirculation system.

USER'S JOURNEY

RESEARCHER'S JOURNEY



STUDENT'S JOURNEY