

SISU

greenhouse

“Cultivating resilient living”





ENERGY WELL
GEOTHERMAL HEATING

TROMBE WALLS

SILVICULTURE

HAPPINESS

CULTURE

WELLBEING

CIRCULAR ECONOMY BUILDING MATERIALS

PRODUCTIVITY

PHOTOVOLTAIC PANELS

KNOWLEDGE

ECOLOGICAL SUCCESSION

CRADLE-TO-CRADLE

CONTEMPORANEITY

SISU
greenhouse

REGENERATIVE ARCHITECTURE

PERMACULTURE-INSPIRED LAND USE

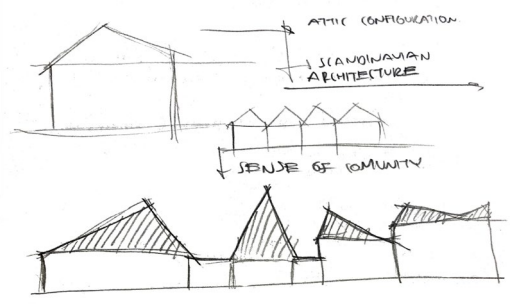
BIOPHILIC DESIGN

MICROTURBINES

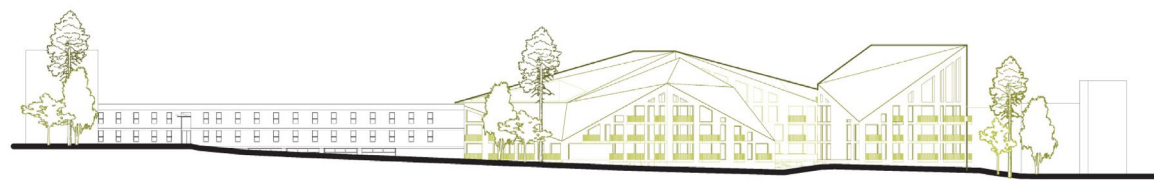
MODERN

FUNCTIONALISM

PHYTOPURIFICATION



SISU
greenhouse

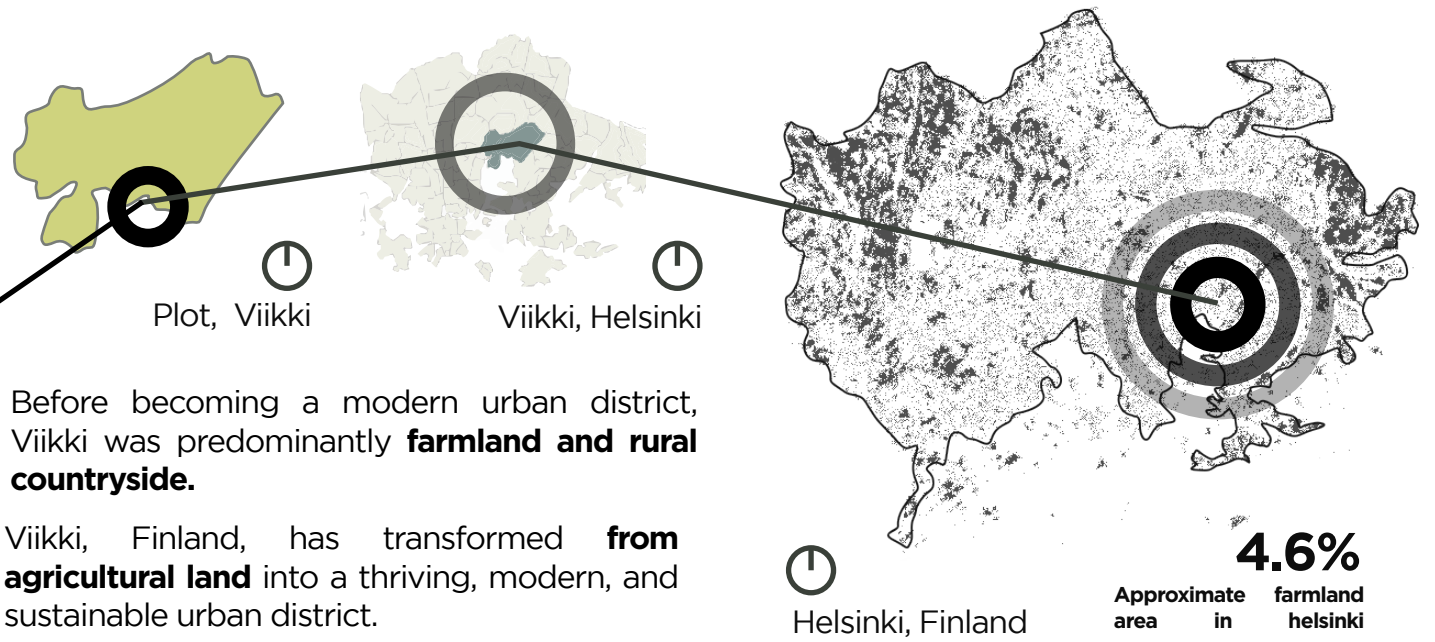
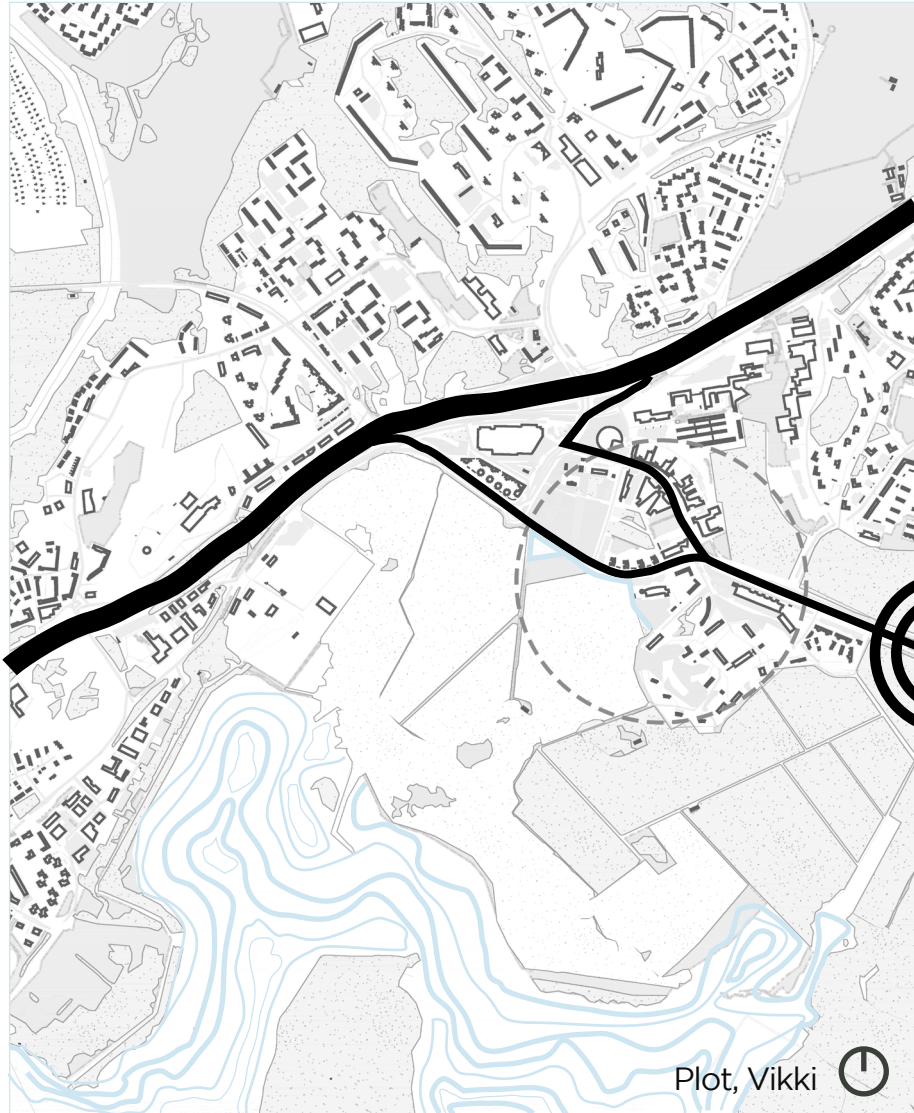
SISU 
greenhouse

“In the spirit of embracing the **uniquely Finnish concept of ‘SISU,’** a term with no direct translation yet encapsulating **strength of will, determination, and perseverance in the face of adversity,** this project envisions a transition from the erosion of Viikki’s agricultural heritage to the cultivation of sustainable, resilient living. Just as **‘SISU’** defines the Finnish people and their character, it signifies the resolute resolve to restore Viikki’s historical farming traditions and **construct a sustainable, resilient future”.**



Location

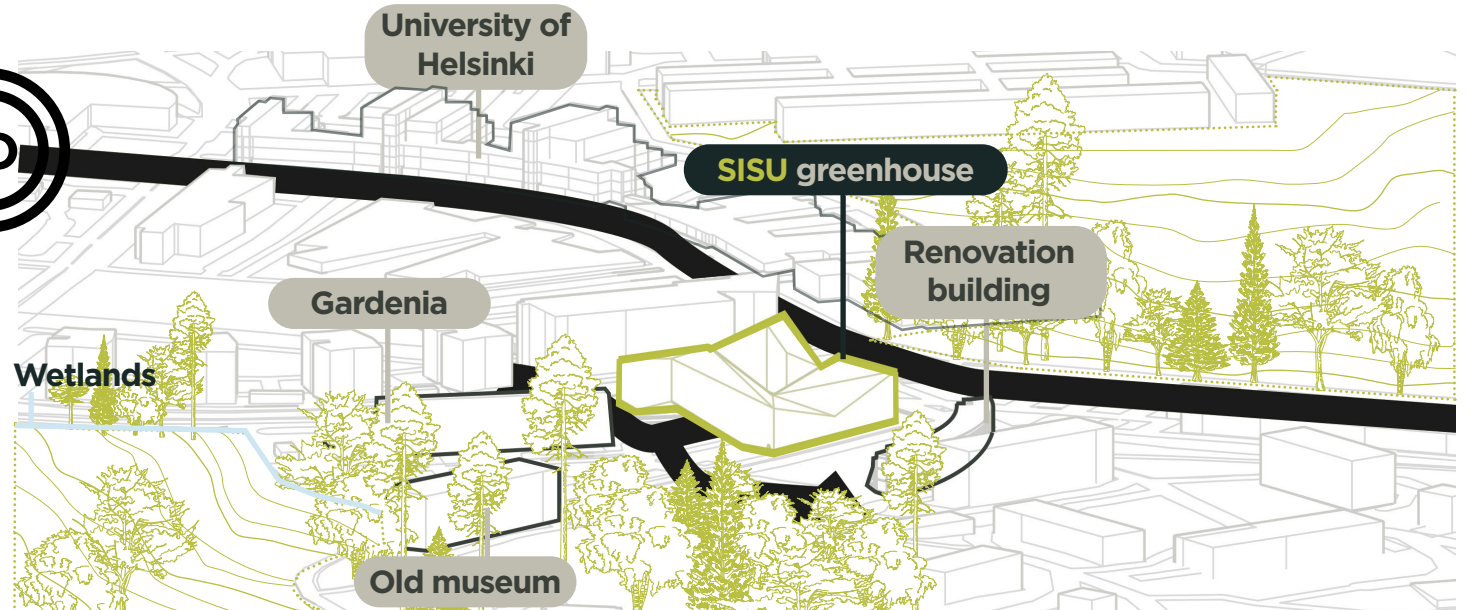
Helsinki is the capital, primate, and most populous city of Finland. Located on the shore of the Gulf of Finland.



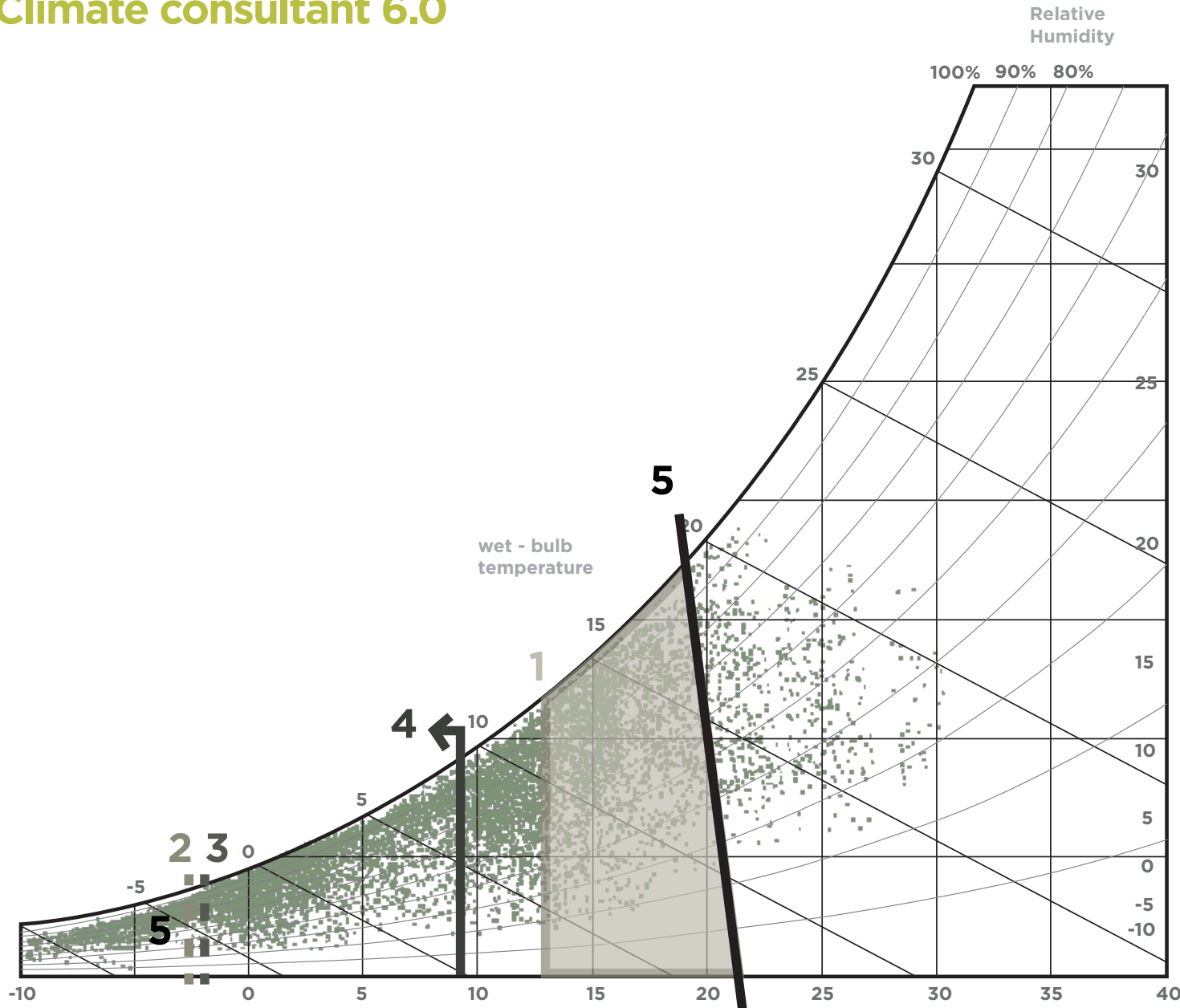
Before becoming a modern urban district, Viikki was predominantly **farmland and rural countryside**.

Viikki, Finland, has transformed **from agricultural land** into a thriving, modern, and sustainable urban district.

4.6%
Approximate area in farmland helsinki



Climate consultant 6.0



5 'Must apply' bioclimatic strategies according to Climate Consultant.

- 1. Internal heat gain
- 2. Passive solar direct gain low mass
- 3. Passive solar direct gain high mass.
- 4. Wind protection of outdoor spaces.
- 5. Heating, add humidification if needed.

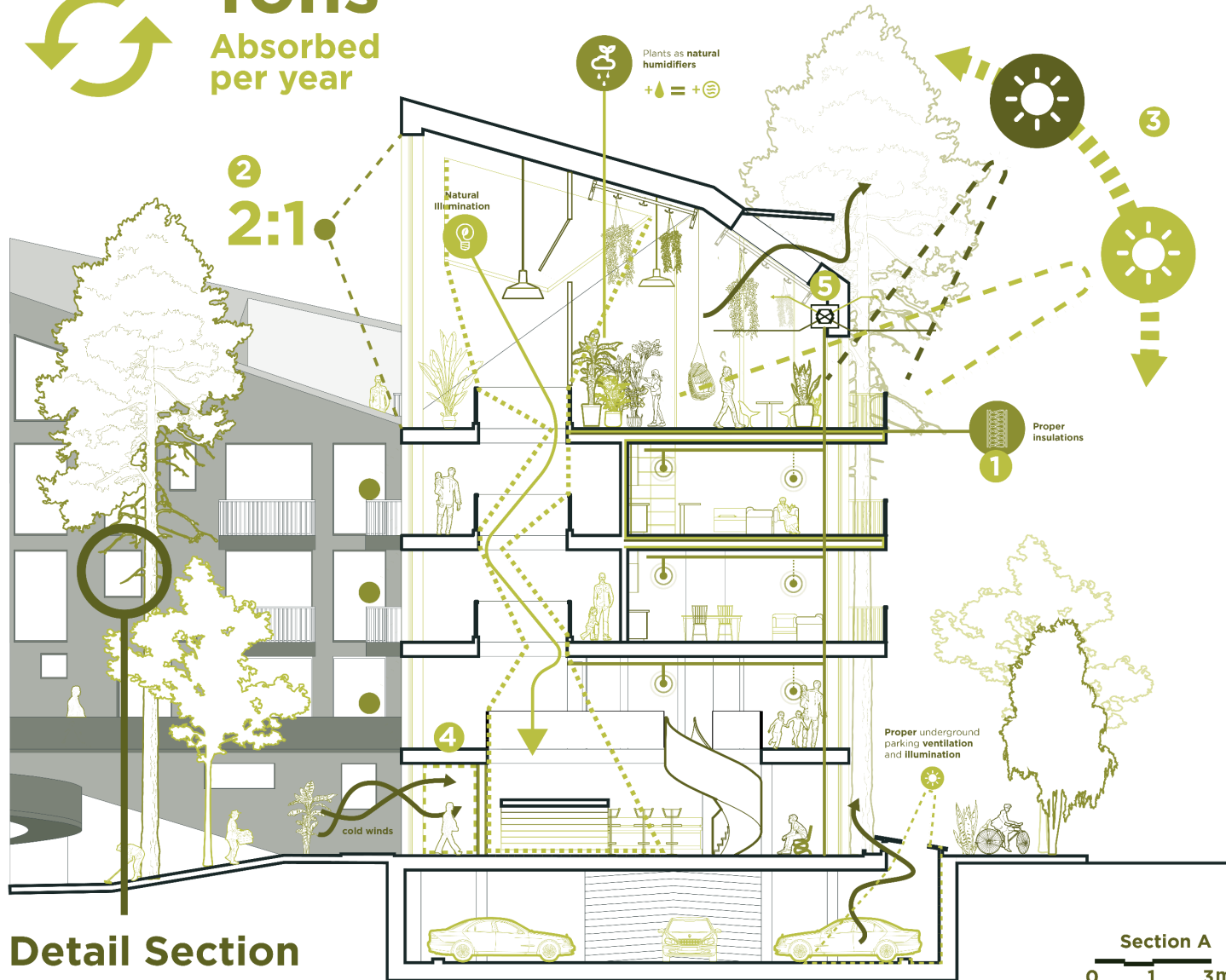
5 SISU Greenhouse Translations, Green Building

- 1. Appropriate **Insulations**
- 2. Wall/window **Ratio 2:1**
- 3. Building **Orientation**
- 4. Vestibules, **Air locks**.
- 5. Heat pumps, **HVR**.

99.6%

Comfortable hours per year achieved through this strategies.

**15.73 CO²
Tons**
Absorbed
per year



Detail Section

5 'Must apply' bioclimatic strategies according to Climate Consultant.

1. Internal heat gain
2. Passive solar direct gain low mass
3. Passive solar direct gain high mass.
4. Wind protection of outdoor spaces.
5. Heating, add humidification if needed.

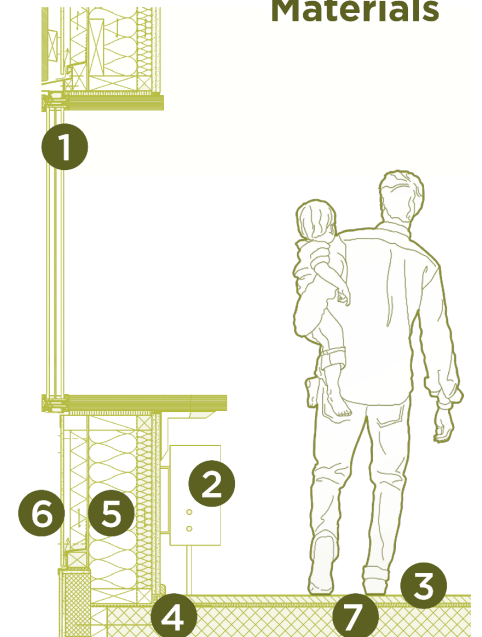
5 SISU Greenhouse Translations, Green Building

1. Appropriate **Insulations**
2. Wall/window **Ratio 70%**
3. Building **Orientation**
4. Vestibules, **Air locks** .
5. Heat pumps, **HVR**.

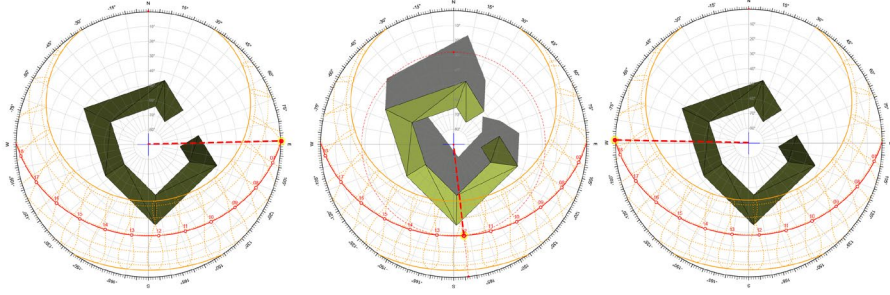
Detail Section

- 1 Triple glazed windows
- 2 HVR
- 3 **RIGIS** Plasterboard
- 4 **ISOVER** multimax 30
- 5 Construction wall
- 6 **WEBER** mineral plaster
- 7 **CLT** Floor slab

- 1 Appropriate Insulations
- 2 2:1 Wall/Window ratio
- 3 Building Orientation
- 4 Vestibules, Air locks
- 5 Heat pumps, HVR

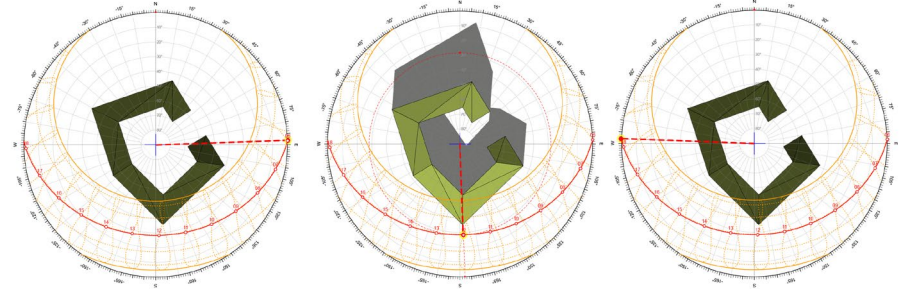


Solar Analysis



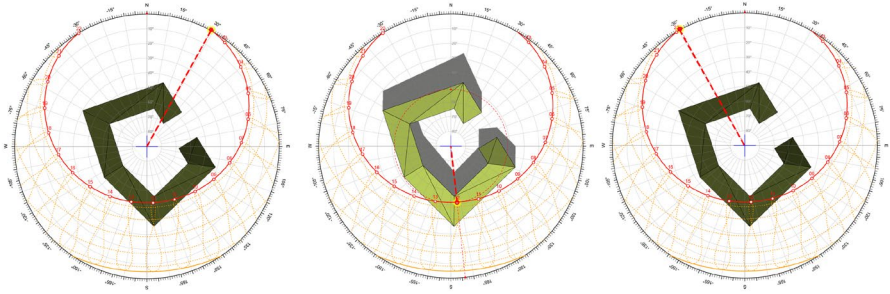
Spring
March - May

Average daylight
14hrs
|||||



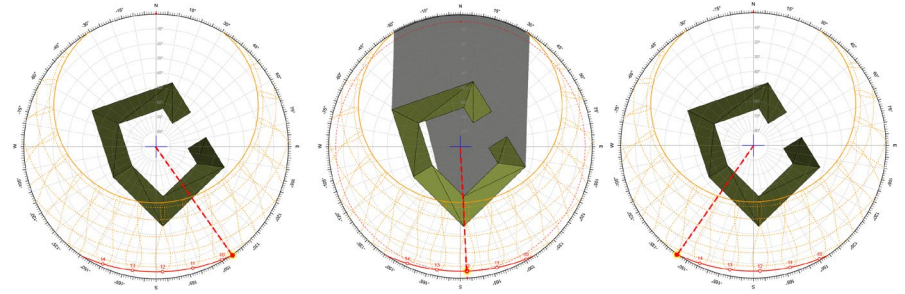
Fall
September - November

Average daylight
14hrs
|||||



Summer
June - August

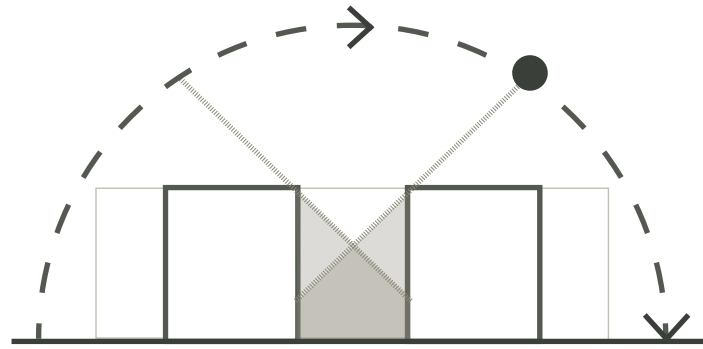
Average daylight
18hrs
|||||



Winter
December - February

Average daylight
6hrs
|||||

Concept

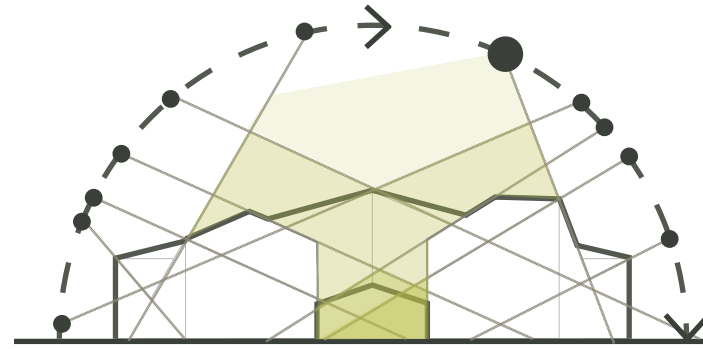


Traditional tower construction often limits natural light, casting pronounced shadows due to its rectangular form, which may not optimize illumination for the building.



Natural light

Shadows projected

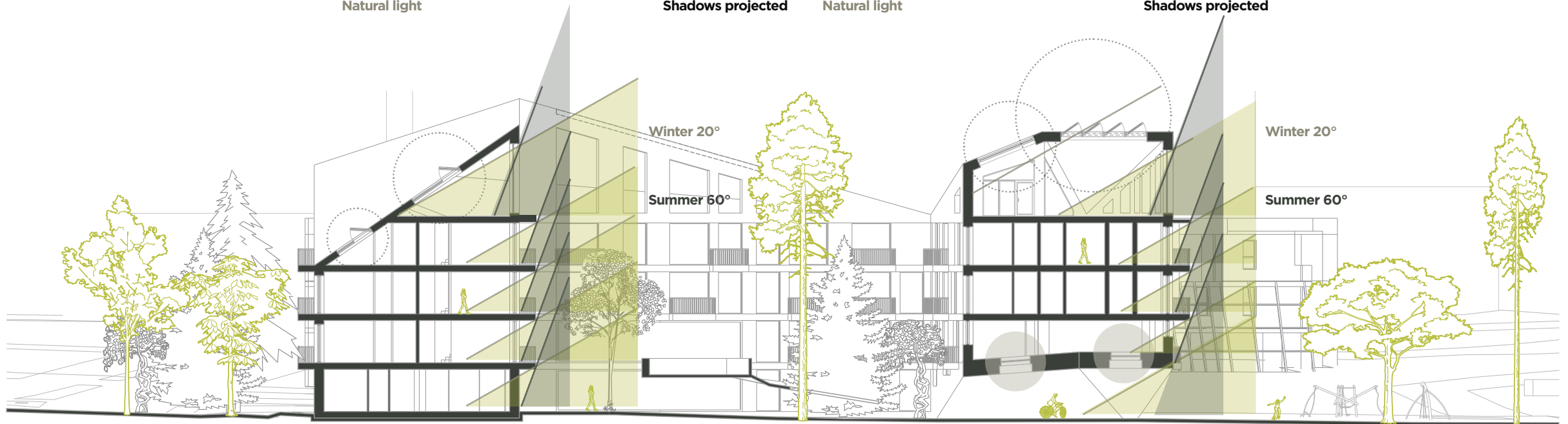


Incorporating multiple slopes on the roof maximizes natural light penetration into the central patio, creating a luminous space.



Natural light

Shadows projected



Concept

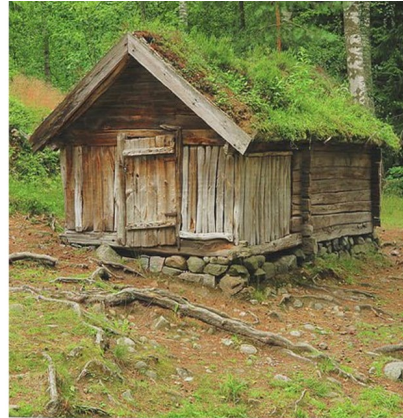
PREHISTORIC AND INDIGENOUS ARCHITECTURE



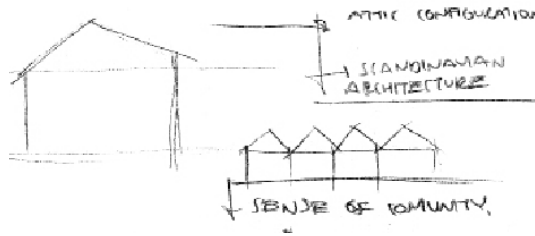
Indigenous Sámi - Kotas
Easy to assemble and disassemble.



LOG CONSTRUCTION



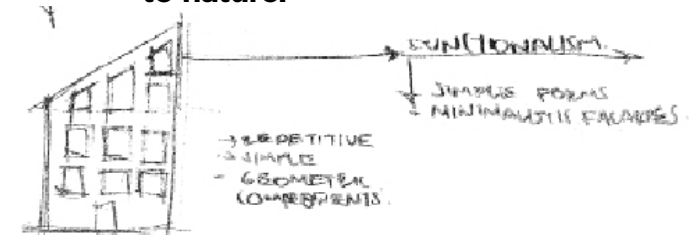
Cabins were simple and practical, designed to **withstand** the **harsh Nordic climate**.



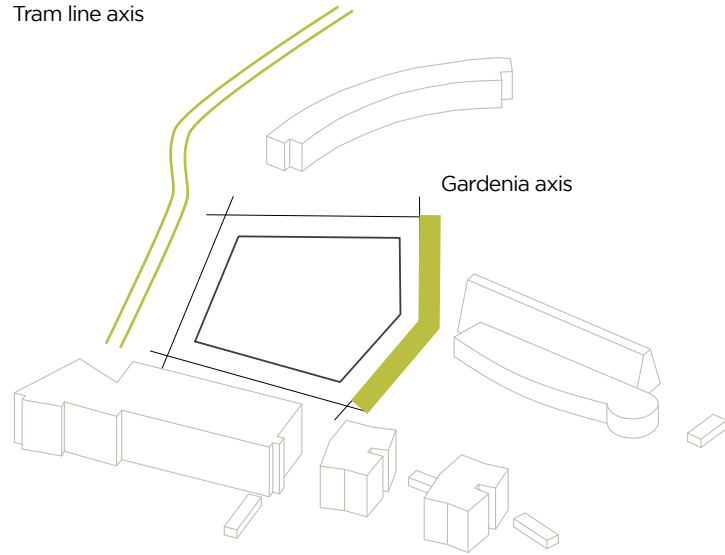
FUNCTIONALISM AND MODERNISM_ALVAR AALTO



Innovative designs that combine functionality, aesthetics, and a **connection to nature**.

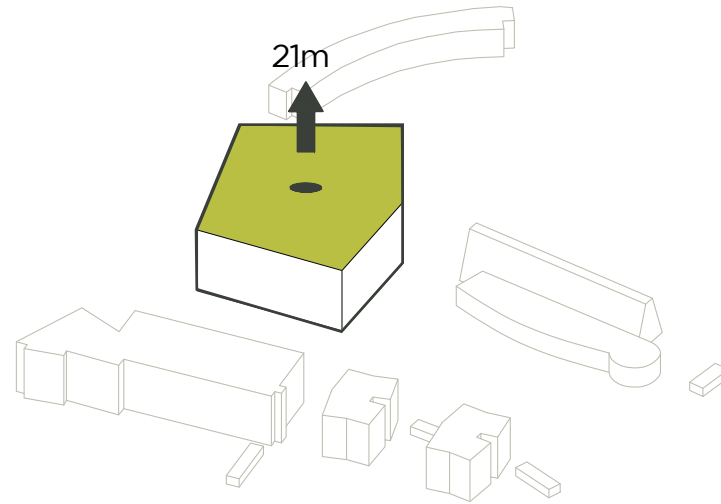


Concept



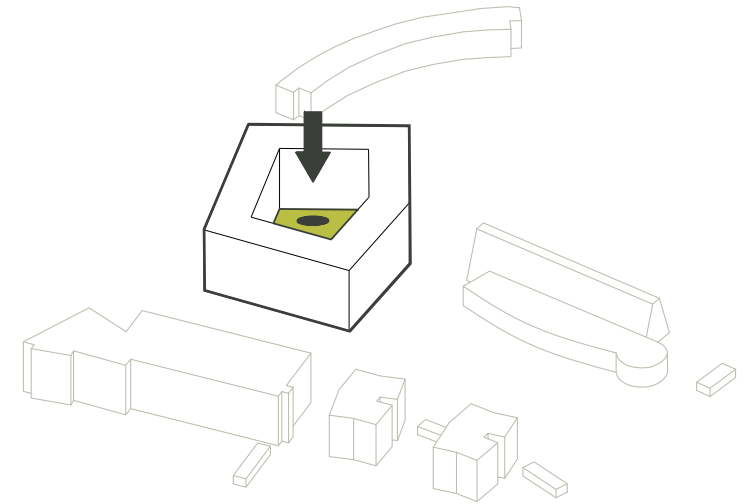
1. BUILDING AREA

The plot area has been thoughtfully designed in harmony with the existing context, enabling it to respond to current design axes while also introducing an innovative and distinctive form.



2. MASS

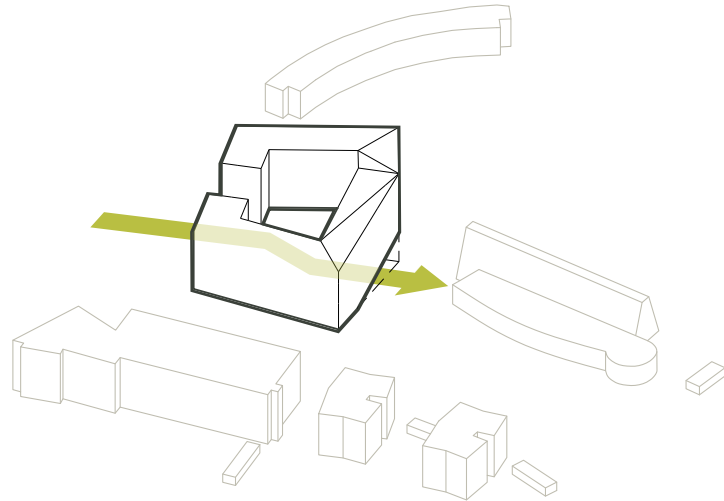
The building's height is carefully determined by a set of context-related requirements, resulting in a total height of 21 meters.



3. COURTYARD

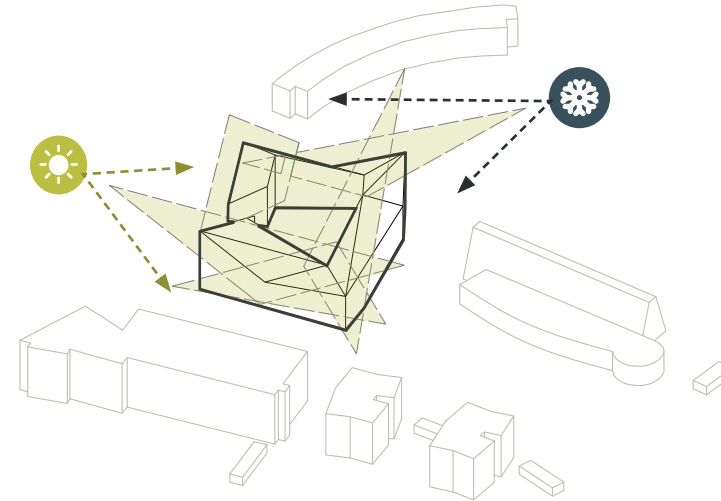
Envisioned within the design is a central courtyard, strategically positioned to enhance the controlled flow of natural light, warmth, and ventilation throughout every corner of the building.

Concept



4. CROSS-LINK

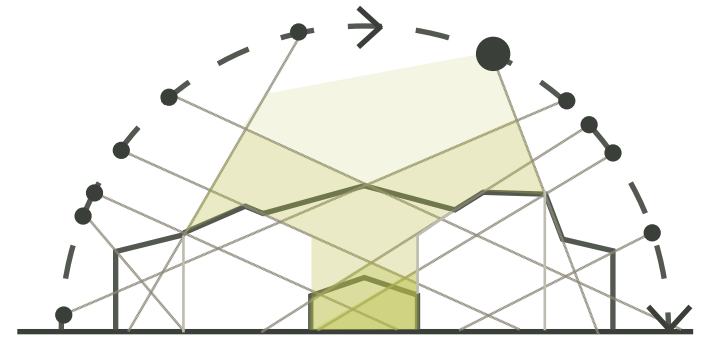
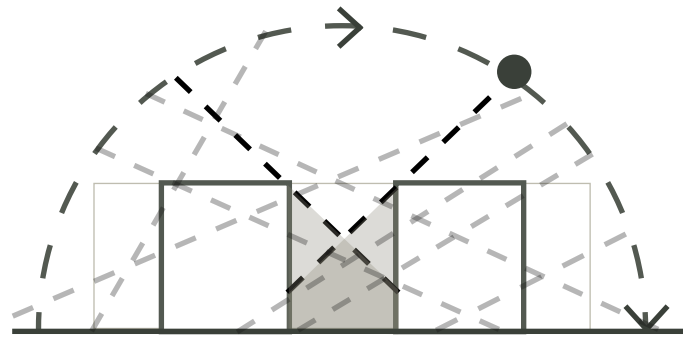
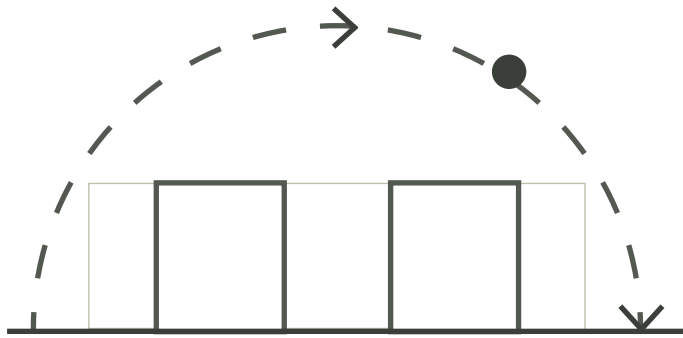
The architectural volume gracefully unfurls, allowing for smooth pedestrian traffic between the patio and the project, with the intent of seamlessly connecting it to the Gardenia.



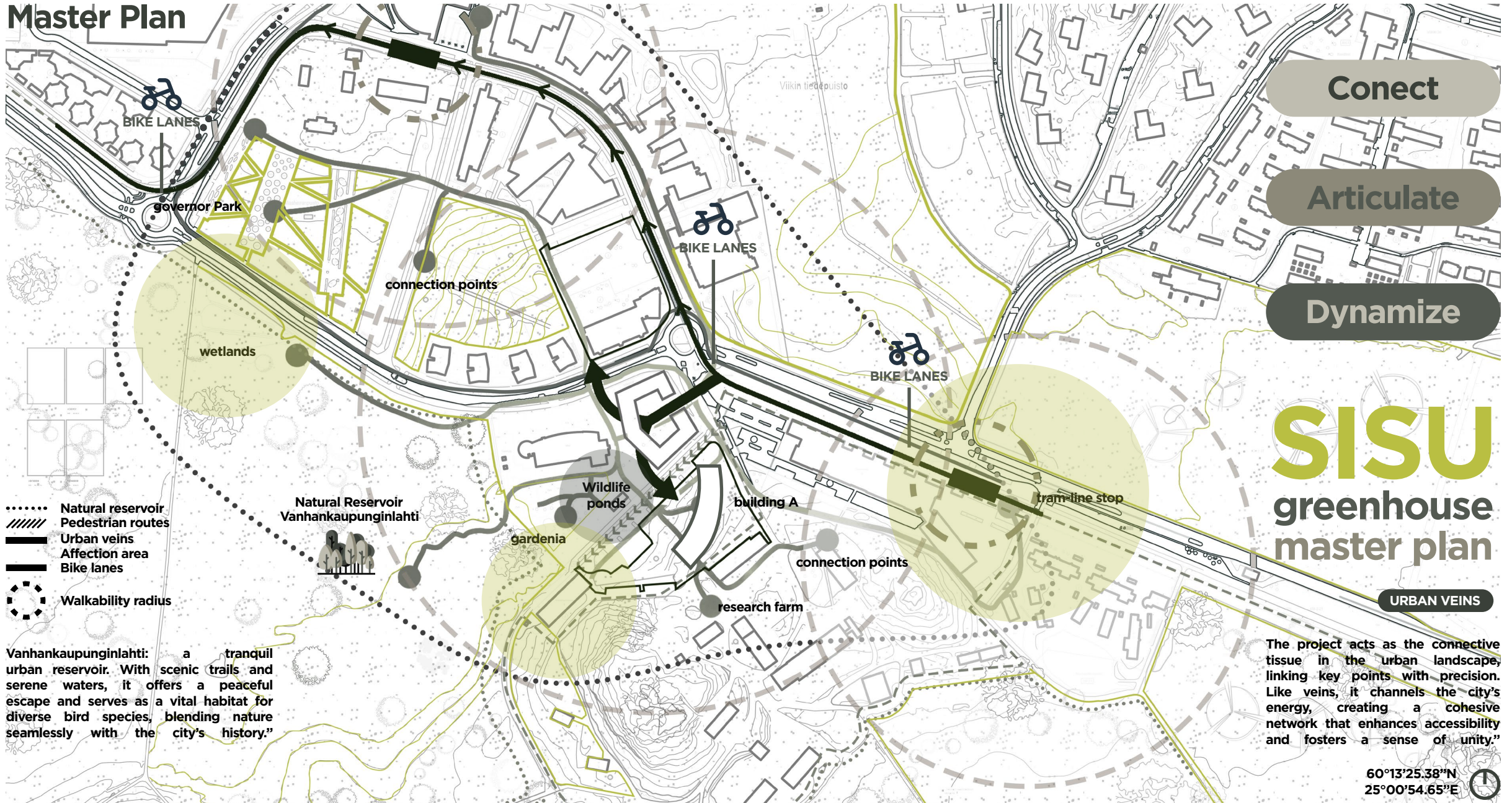
5. ROOF DYNAMISM

The project's dynamic roof design maximizes natural light and sun warmth for each apartment, creating a bright and cozy living space.

Concept



Master Plan



Conect

Articulate

Dynamize

SISU greenhouse master plan

URBAN VEINS

- Natural reservoir
- //// Pedestrian routes
- Urban veins
- Affection area
- Bike lanes
- Walkability radius

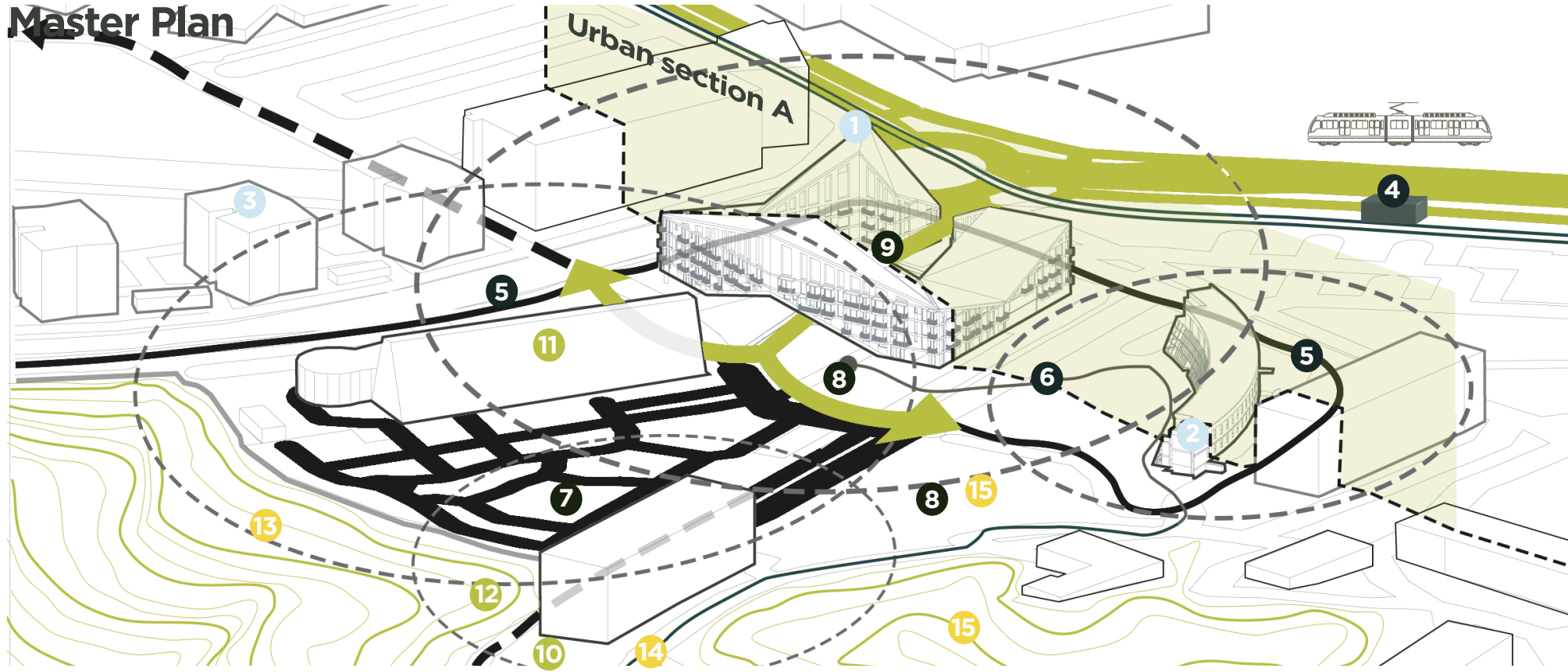
Vanhankaupunginlahti: a tranquil urban reservoir. With scenic trails and serene waters, it offers a peaceful escape and serves as a vital habitat for diverse bird species, blending nature seamlessly with the city's history."

The project acts as the connective tissue in the urban landscape, linking key points with precision. Like veins, it channels the city's energy, creating a cohesive network that enhances accessibility and fosters a sense of unity."

60°13'25.38"N
25°00'54.65"E



Master Plan



- 1 SISU Greenhouse
- 2 Building A
- 3 Studentt housing
- 4 Tram line
- 5 Cycling routes
- 6 Pedestrian routes
- 7 Japanese Garden
- 8 Urban farming
- 9 Bio Yard
- 10 Farming center
- 11 Gardenia
- 12 Ruin garden
- 13 Natural reserve
- 14 Bio trip
- 15 Silviculture

SISU Greenhouse

New Building A

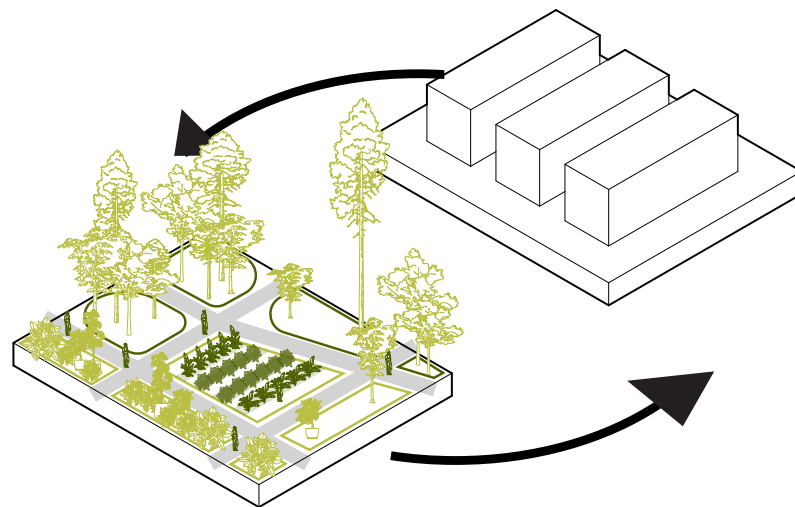


Urban section A

Japanese Garden



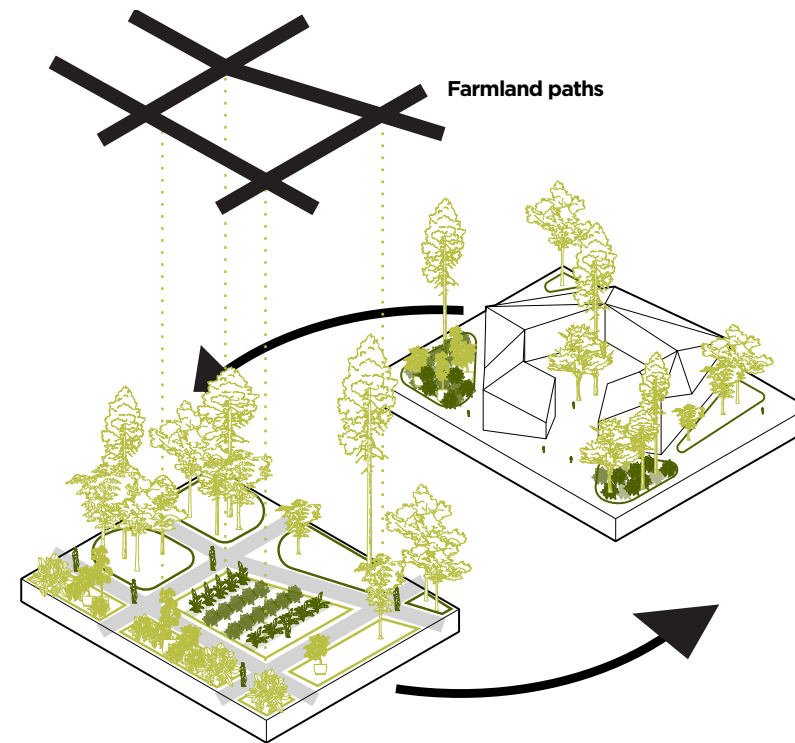
Vision



Transitioning from the Erosion of Viikki's Agricultural Heritage...

In the heart of Viikki, Helsinki, this project **symbolizes the unwavering "SISU" spirit of the Finnish people**. It's a response to the gradual **erosion of Viikki's agricultural heritage** under the pressures of urban development. The project envisions a landscape where the **resilience** of the past meets the **sustainability** of the future. With thoughtful design and a commitment to sustainability, it's a testament to Viikki's potential to become a **thriving, resilient community**.

Erosion: Erosion is the gradual process by which rocks and soil are worn away by natural forces such as wind, water, or ice, leading to the reshaping of landscapes over time.



... to the Cultivation of Sustainable, Resilient Ways of Living.

The transition from heritage erosion to sustainable, resilient living is a reflection of Viikki's unwavering "SISU" spirit. It embodies our commitment **to reconnect** with the land **and thrive** in the face of evolving challenges. With this project, Viikki strides forward to redefine its future, where the echoes of the past harmonize with the **aspirations of a sustainable, resilient community**.

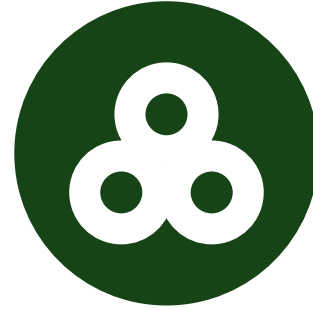
Principles



1. SUSTAINABLY VITAL



2. HERITAGE-RENEWING



3. COMMUNITY-UNIFYING



4. SKILL-ENHANCING



5. RESILIENT-SPIRITED



VELUX®

The **SISU Greenhouse**, inspired by VELUX's Compass Model, embodies five core principles: sustainability vitalization, heritage renewal, community unification, skill enhancement, and resilient spirit. Through their integration, the project redefines architectural practices, setting a new standard for sustainable and socially impactful design.

Principle

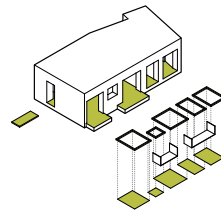
Strategie

Performance



1. SUSTAINABLY VITAL

Promote sustainability as the core ethos of the project, encompassing architectural design, resource management, and community living.



Embodied Energy

Residences are meticulously crafted with a strong emphasis on material efficiency, aiming to significantly reduce their carbon footprint.

Low impact materials



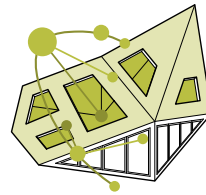
Material efficiency



Biomased materials



87%



Operational Energy

Implementing top building practices boosts the home's energy efficiency and durability during its operational phase.

Energy efficient systems



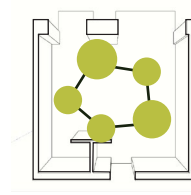
Renewable energy sources



Energy-saving design



93%



Multi Comfort

Adopting multi-comfort principles enhances the home's livability and sustainability during its occupancy, ensuring a cohesive blend of environmental quality and energy efficiency.

Saint Gobain principles



Climate resilient design



96%



Material Sourcing

Promote sustainability as the core ethos of the project, encompassing architectural design, resource management, and community living.

Certified materials



Local materials



Healthy materials

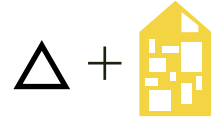
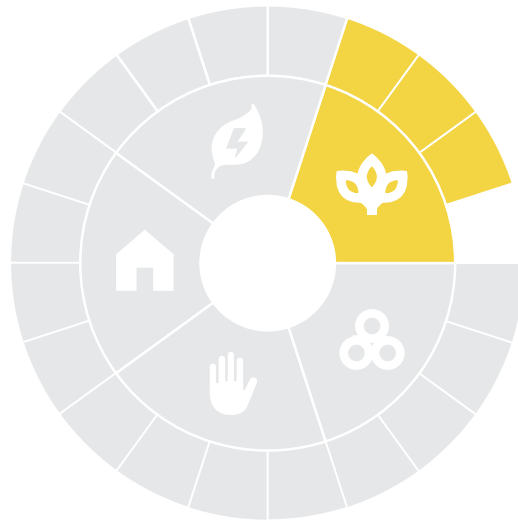


93%

Principle

Strategie

Performance



Learning from history

Thorough analysis of historical precedents and their contributions to the present situation.

Heritage learning spaces



96%



Activity engagement

In-depth exploration of past engagements and their influence on current activities.

Farming activities



Building activities



93%

Green life spaces



Past as a base for the future

Drawing lessons from vernacular architecture's efficient practices of the past informs our contemporary imperative to optimize efficiency in our present endeavors.

Vernacular architecture



96%

2. HERITAGE-RENEWING

Revitalize and preserve Viikki's agricultural heritage, honoring its historical farming practices and cultural significance.

Principle

Strategie

Performance



3. COMMUNITY-UNIFYING

Foster active community participation, collaboration, and shared responsibility, forming a strong and connected Viikki community.



Belonging

Fostering a connection to a community with a distinct identity promotes social cohesion, alongside mental and physical well-being.

Architectural identity



Culture



90%



Variety

Avoiding monotonous regularity, structured variation in scale, typology, materiality, and users should be ensured to create a more natural and diverse environment.

Scale



Typology



93%

Materiality



Community safety

Proximity to familiar faces fosters a sense of trust and security, heightening both perceived and actual safety levels.

Green outdoors



96%



Engagement

Empowering individuals to actively shape their living spaces fosters a deeper sense of community and connection to place.

Shared gathering areas



Local initiatives



99%

Inclusiveness



Principle

Strategie

Performance



Farming culture

Residences are meticulously crafted with a strong emphasis on material efficiency, aiming to significantly reduce their carbon footprint.

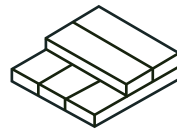
Urban crops



Comunity gathering



87%



Building culture

Implementing top building practices boosts the home's energy efficiency and durability during its operational phase.

Low carbon footprint



Local materials



93%

15.73
CO² Tons
absorbed
per year

Environmentally active

Adopting multi-comfort principles enhances the home's livability and sustainability during its occupancy, ensuring a cohesive blend of environmental quality and energy efficiency.

Climate understanding



Comfort levels



96%

4. SKILL-ENHANCING

Provide opportunities for skill development and knowledge sharing within the community to support sustainable living and farming practices.

Principle

Strategie

Performance



5. RESILIENT-SPIRITED

Develop a resilient community capable of adapting to changing times and challenges, with a focus on climate resilience.



Durability

Homes are crafted with resilience in mind, with each component carefully selected to ensure longevity and suitability for its intended purpose over time.

Durable materials



Easy maintenance



87%



Outdoor connection

Outdoor and semi-outdoor areas are designed to be easily accessible, visible and inspiring.

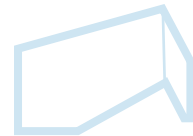
Direct view to nature



Direct access to nature



100%



Assembly

Thoughtful integration of building components ensures harmonious and visually appealing interfaces throughout the structure.

Disassembly

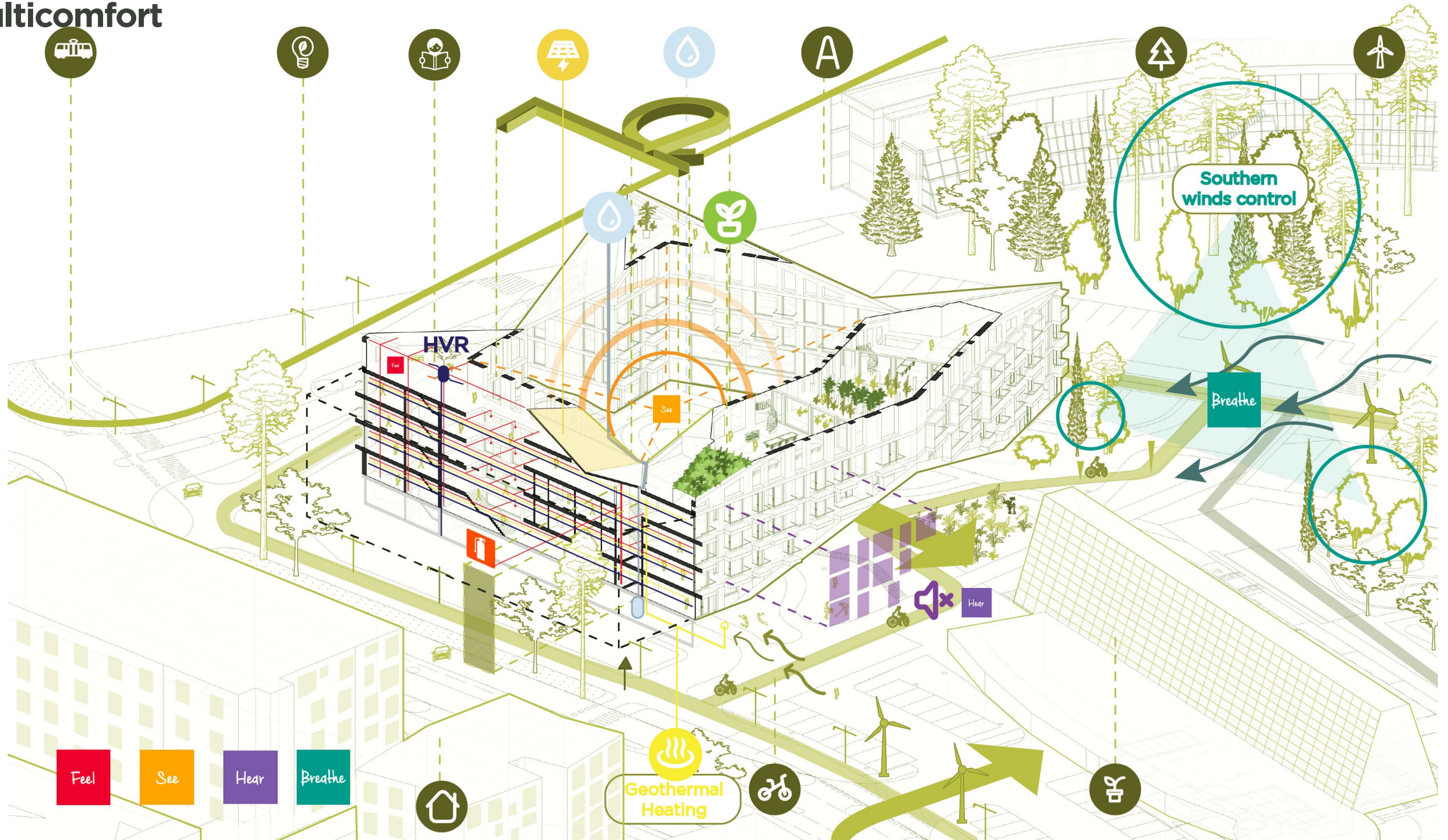


Easy replacement



96%

Multicomfort



Underground Parking

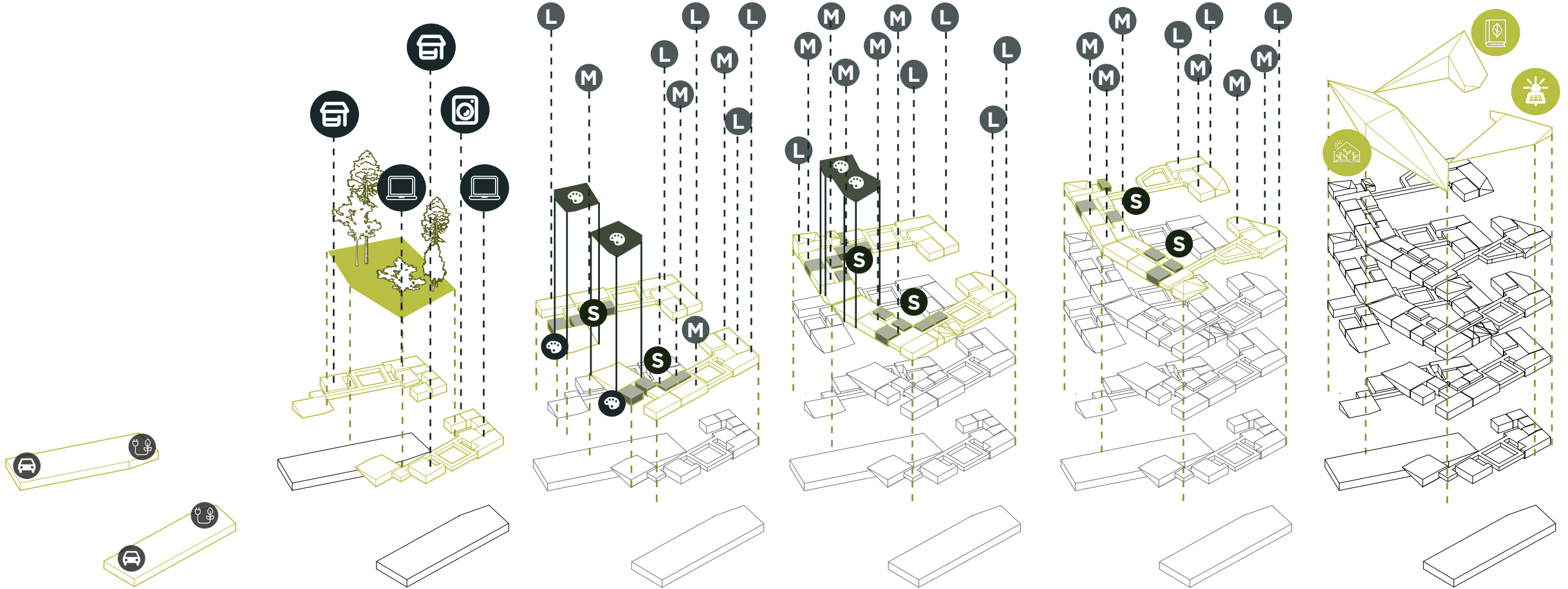
Ground Floor

First Floor

Second Floor

Third Floor

Fourth Floor



Greenhouse

SISU living units

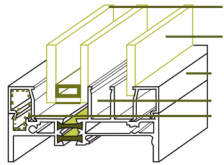
For us, for everyone

Services

 Community crops	 Green energy areas	 Study	S Small	M Medium	L Large	 Local commerce	 Services	 Co - working	 Creative spaces	 Parking	 Green energy services
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Illumination

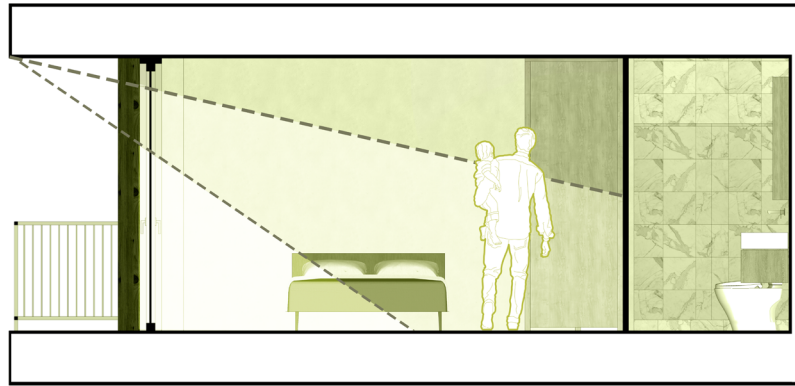


- Exterior insulated protection glass Glassolutions
- Interior stained glass Glassolutions
- Separate glazing beads
- Air space
- Isolated water pocket

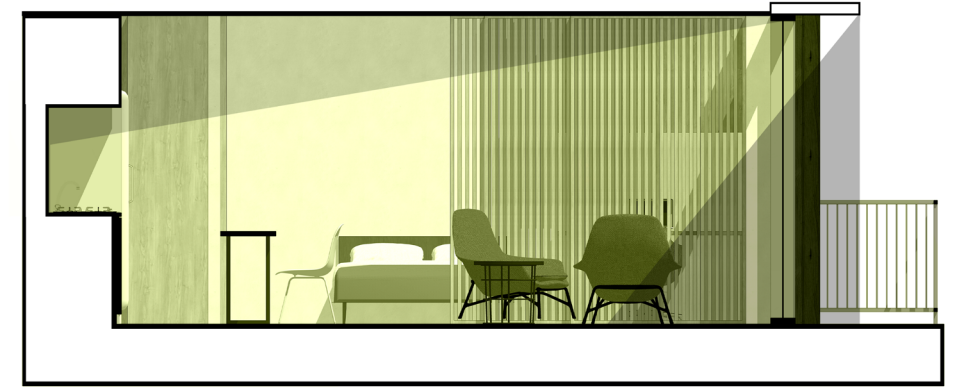
85% Natural light for spaces
Subtle sun control in summer

Summer 60°

Winter 10°

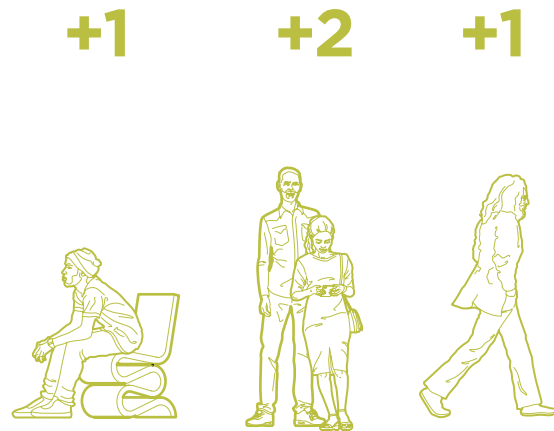


Type M apartment
Bedroom

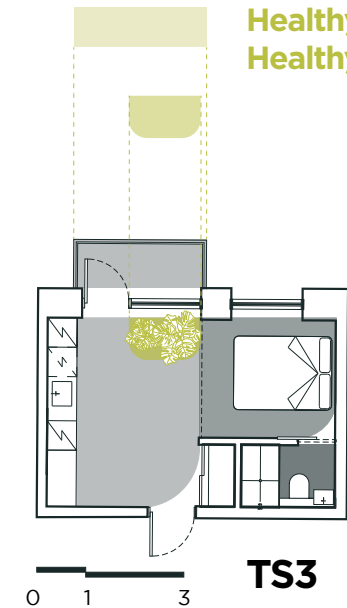
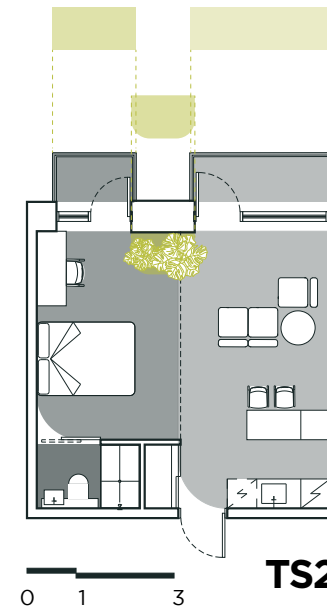
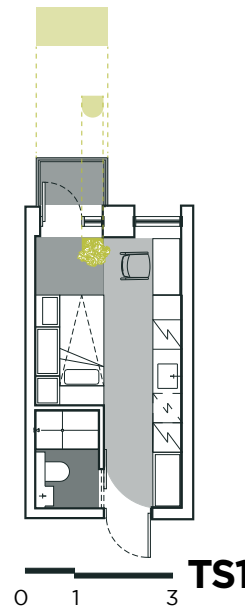


+87% Natural Light
Subtle sun control in summer

**Sound proof
Thermal Insulation**



**Type S
Students**



**Healthy homes,
Healthy life.**



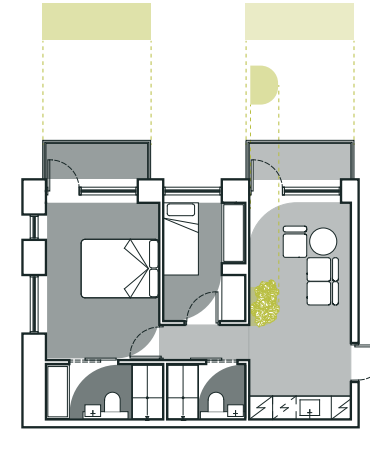
Living Room Illumination **92%** |||||



Bedroom Illumination **87%** |||||

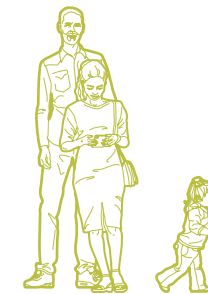


Kitchen Illumination



Type M

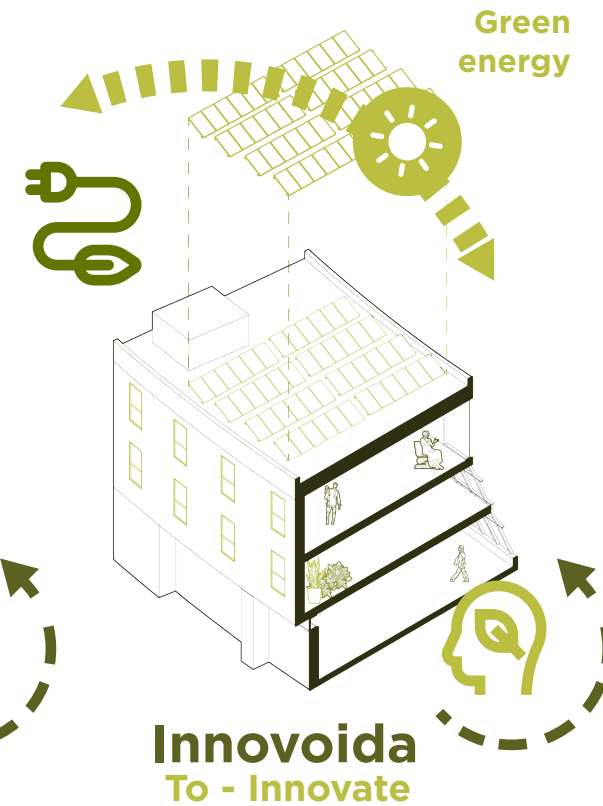
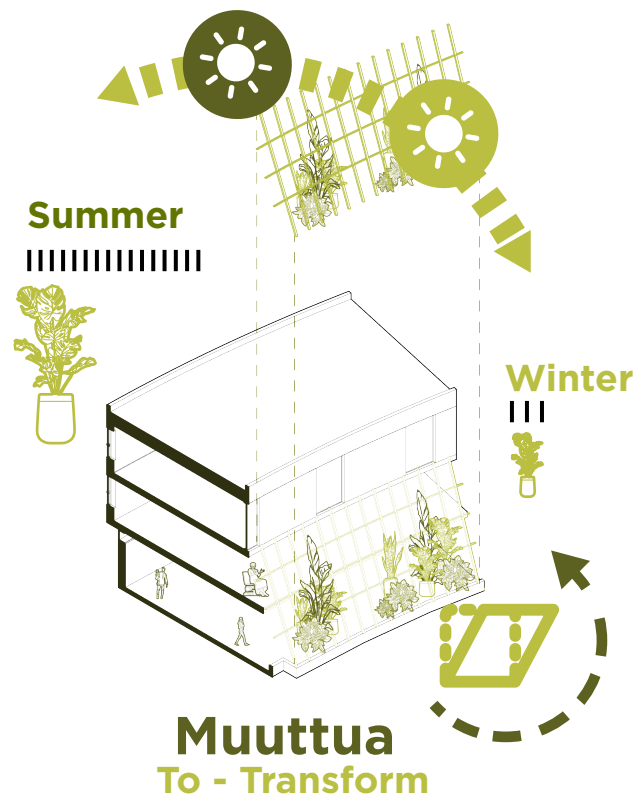
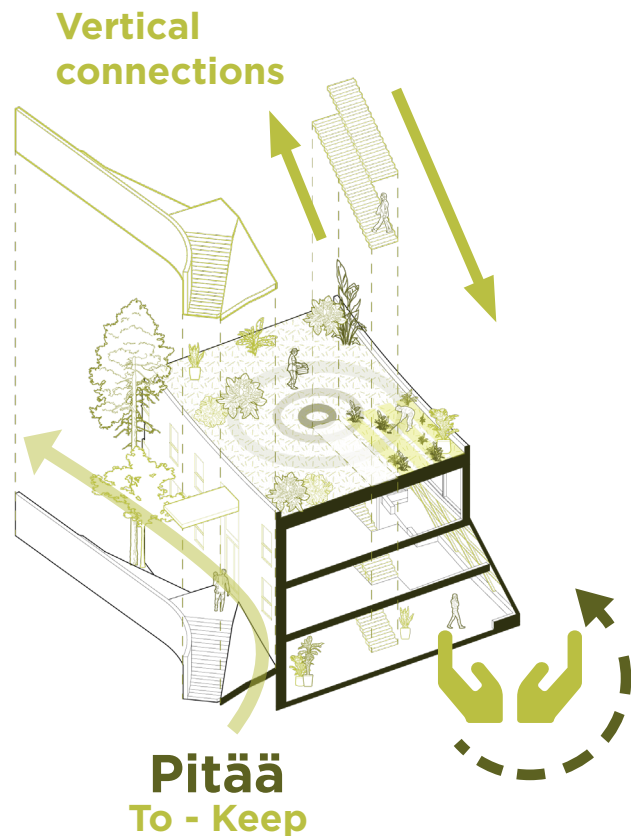
2+1



1+1



4 Key Renovation Strategies.



Bioclimatic section

Eco-Innovative Energy Solutions     

R-60

Value through layers.

HVR
Heat ventilation recovery

U- 0.15
W/m²K

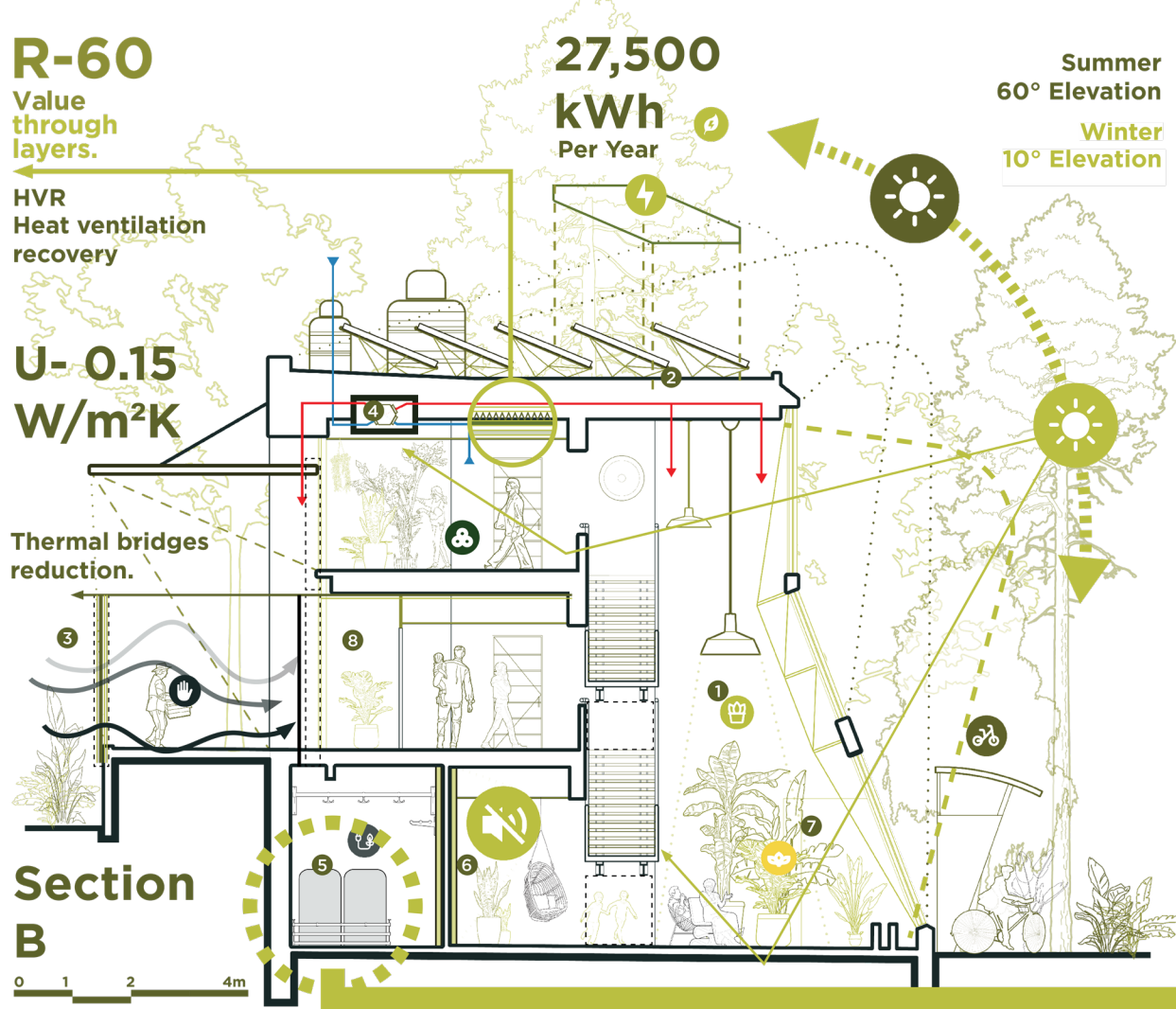
Thermal bridges reduction.

Section
B

27,500
kWh
Per Year

Summer
60° Elevation

Winter
10° Elevation

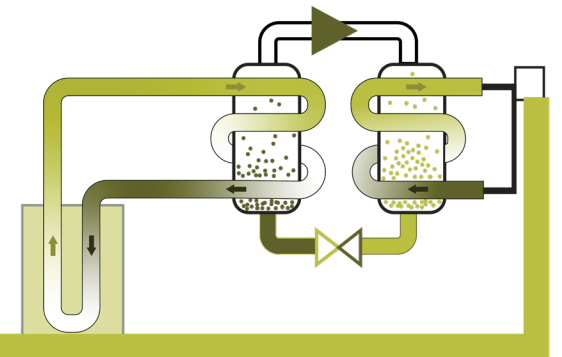


Bioclimatic Section

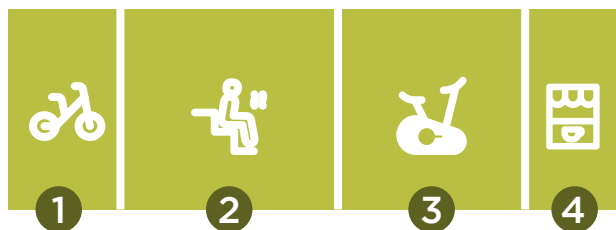
- 1 Humidifying garden
- 2 Green roof
- 3 Triple glazed windows
- 4 HVR
- 5 Heat pump
- 6 Walls insulation
- 7 Greenhouse effect
- 8 Bio - vestibules

Heat pumps

Through geothermal heating as a green response



Program



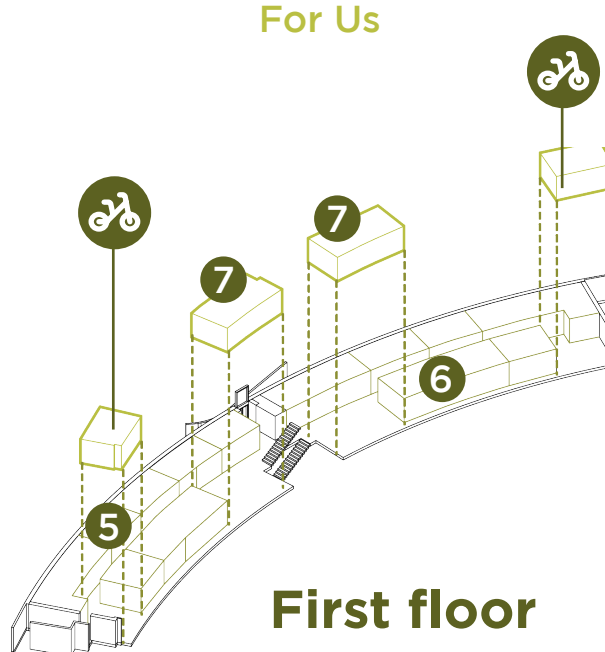
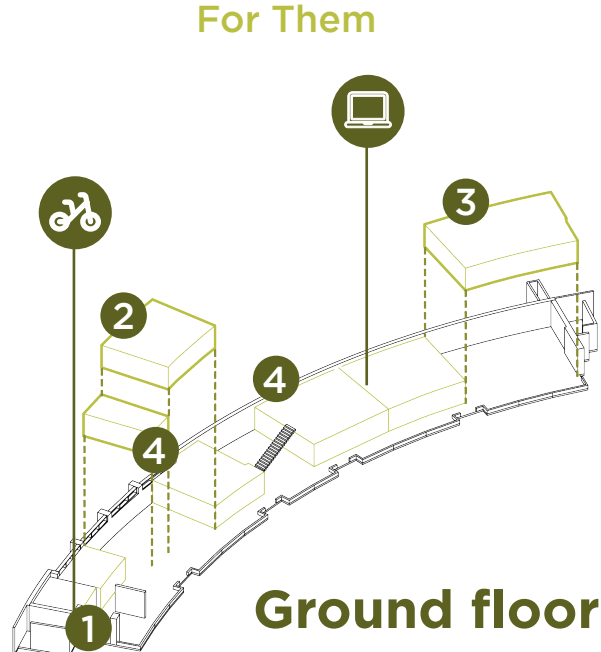
Heille
For Them



Meille
For Us



Kaikille
For Everyone

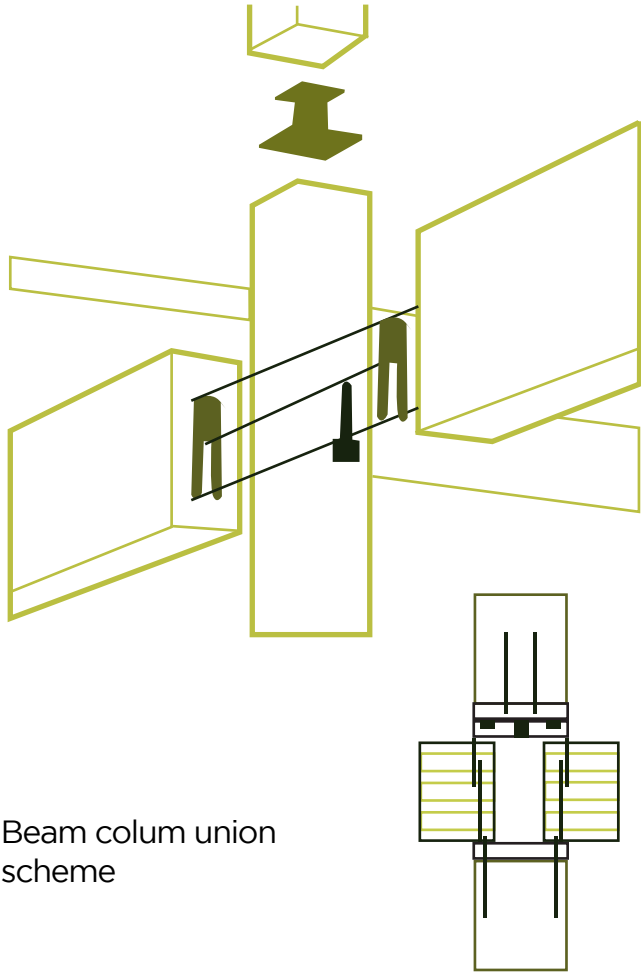




Renovation Building

Structure





Beam column union scheme

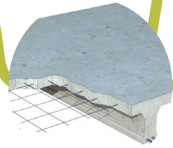
The Sisu Greenhouse stands as a testament to **sustainable architecture**, boasting a **timber-based structure supported by steel frames**.



Foundation Terrain Deck Exterior Wall Interior Walls



Concrete Foundation



Recycled concrete for deck



placo
SAINT-GOBAIN
Gypsum board
0.32 glass wool



weber
SAINT-GOBAIN

External wall insulation (EWI) in rigid wood fiber, Webertherm. Thickness : 200mm

Structure

Floor Decks



placo
SAINT-GOBAIN
Acoustic soundproof gypsum



isover
SAINT-GOBAIN
Panel solado
0.036w M*K



ecophon
SAINT-GOBAIN
Plenum and acoustic panels Ecophon Solo™ 12

Finishes

Roof



isover
SAINT-GOBAIN
Glass wool insulation



isonat

Insulation between rafters, wood fiber, ISONAT FLEX, 100 mm

Windows



SAINT-GOBAIN

Saint gobain cool lite xtreme glass triple glazed windows



RECYCLED WINDOWS IN SITU

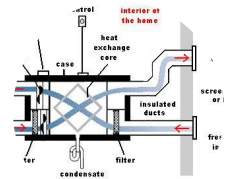
Solar Cells



Photovoltaic panels

Technical System

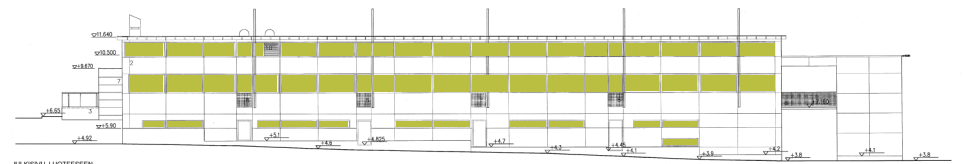
Ventilation

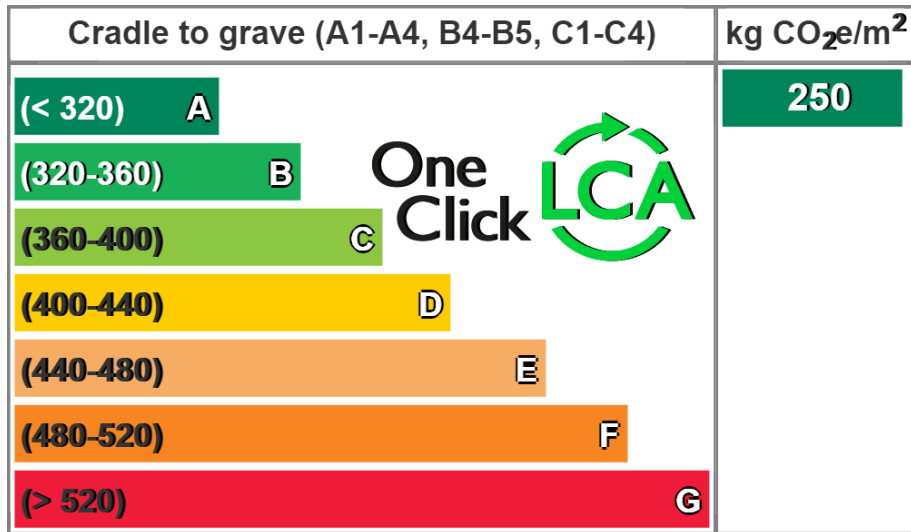


- workings of an

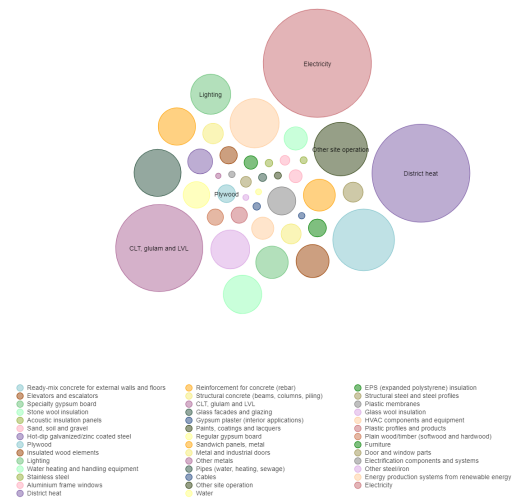
HVR

128 Windows recycled to complete the life cycle of LCA old buildings.



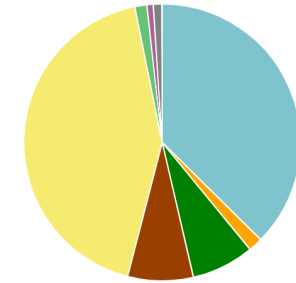


Bubble chart, total life-cycle impact by resource type and subtype, Global warming



Global warming kg CO_{2e} - Life-cycle stages

- A1-A3 Materials - 37.4%
- A4 Transport - 1.7%
- A5 Construction - 7.3%
- B4-B5 Replacement - 7.6%
- B6 Energy - 42.8%
- B7 Water - 0.0%
- C1 Deconstruction/demolition - 1.4%
- C2 Waste transport - 0.7%
- C3 Waste processing - 1.0%
- C4 Waste disposal - 0.0%

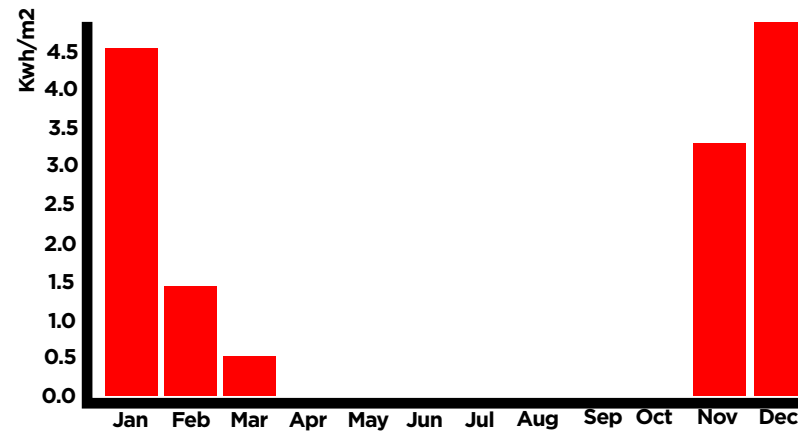


International SG SAVE
Energy needs verification

Required
15.0Kwh/m²

SISU
14.5Kwh/m²

Heating needs



Overall Lighting
autonomy 300 Lux

85%
South Facade

