ACT OF BUILDING - ACT III
PRACTICING TRANSFORMATION

SCHRÖDINGERHOF
ROOF 2100 –
A HEAD FOR A HOUSE
Natenael Eshaw Abebe
Lena Erk
Clemens Langeder
Florian Ocenasek

Institut für
Architektur und Entwerfen
Gebäudelehre und
Entwerfen

CONTENT

PROLOGUE

By 2100, Vienna will face higher average temperatures, longer heatwaves and more tropical nights, during which buildings can no longer cool down passively. In dense structures such as the Gemeindebau, this causes severe overheating, especially in upper floors and roof zones exposed to direct solar radiation. At the same time, more extreme and unpredictable weather, including intense rainfall, dry periods and unstable seasonal transitions, will further stress buildings.

These changes create overlapping challenges for architecture. Heat gain must be reduced and passive cooling enabled, since mechanical air conditioning is neither sustainable nor affordable at scale in social housing. Buildings must also respond to seasonal variability, as winters, although milder, still require heat retention and protection from cold and moisture. This calls for systems that adapt over time instead of remaining fixed in one mode.

Rainwater management is another key issue. More intense downpours require roofs to drain water efficiently while temporarily storing and potentially reusing it, for example in evaporative cooling. Longer dry periods, by contrast, call for strategies that retain moisture and support microclimatic regulation.

The social dimension of the Gemeindebau is equally important. Limited private outdoor space and rising heat stress make it necessary to create usable, climate-responsive semi-outdoor spaces, particularly at roof level. The roof can thus become an extension of living space, offering shaded, ventilated areas in summer and protected, sunlit zones in cooler periods.

[1] European Environment Agency (EEA). Urban Adaptation to Climate Change in Europe: Challenges and Opportunities. Copenhagen: EEA, 2016.

CONTEXT

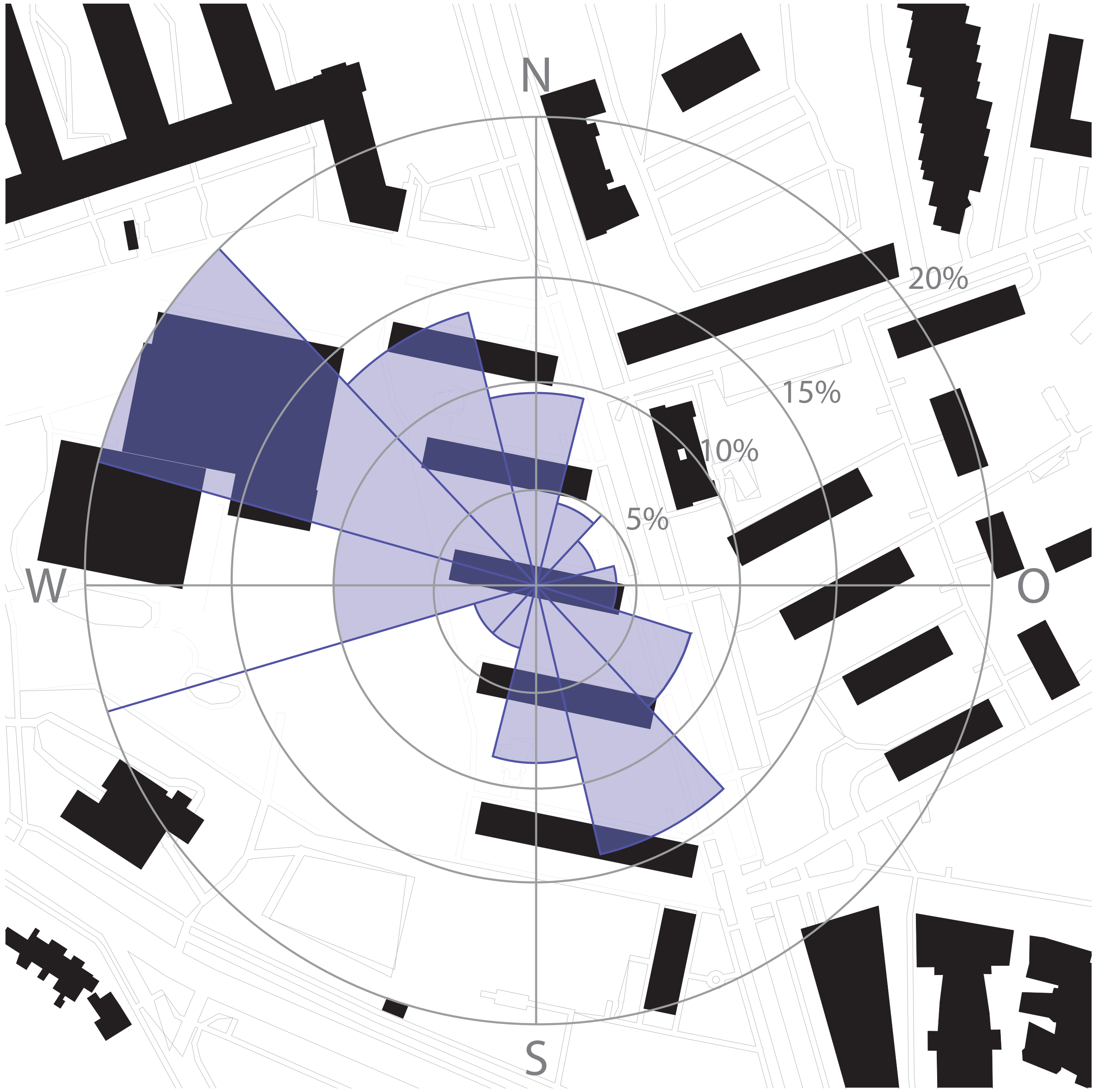
By 2100, Vienna's climate will be noticeably warmer and more extreme, approaching a condition between today's warm-temperate and a subtropical climate. Average summer temperatures are projected to rise to approximately 27–33°C, accompanied by frequent heatwaves above 35°C and a significant increase in tropical nights above 20°C, which substantially limits passive nocturnal cooling of buildings.

Summers are expected to become longer, hotter and drier, while winters, though milder, will still necessitate protection against cold, humidity and wind. Buildings will therefore need to both prevent summer overheating and retain heat during cooler periods. Precipitation is anticipated to occur less frequently but with higher intensity, thereby increasing the risk of heavy-rainfall-induced flooding in dense, highly sealed urban areas.

In housing typologies such as the Viennese Gemeindebau, these developments are further intensified by the urban heat island effect, as compact building structures, low vegetation cover and extensive sealed surfaces promote heat storage, particularly in upper floors and roof zones. Roofs, as the most exposed components of the building envelope, thus become critical for overall thermal performance and must be reconceived from passive protective elements into active climatic interfaces.

Consequently, the architectural focus shifts from heating to cooling, prioritising strategies of shading, ventilation and heat removal. Buildings overall must operate as adaptive systems capable of transitioning between open, ventilated summer states and closed, insulating winter configurations.

[1] Chimani, et al. "Past and Future Changes of the Austrian Climate." ScienceDirect, 2021. https://www.sciencedirect.com/science/article/pii/S2213078021000311



Wind directions on site plan

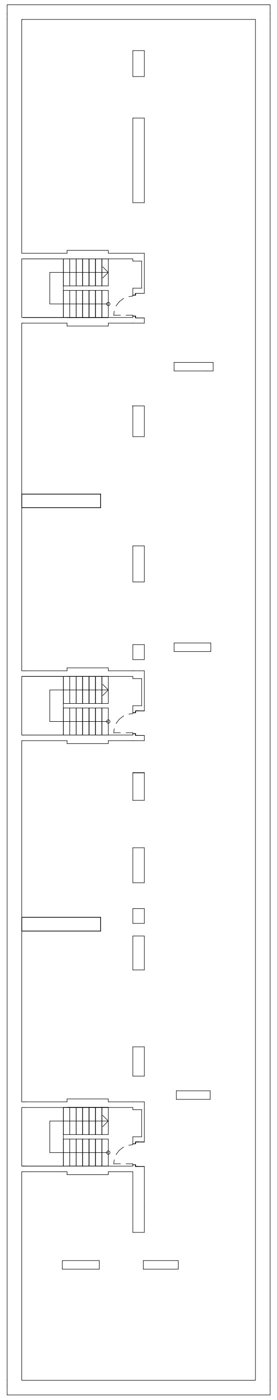
CLIMATIC DEVELOPEMENT

At present, Vienna has average temperatures of around 0°C in winter, 10–15°C in spring and autumn, and 20–26°C in summer. By 2100, these values are projected to rise to approximately 3–6°C in winter, 15–20 °C in spring and autumn, and 27–33°C in summer, meaning an increase of roughly 5°C overall and even more during the hottest months. Over the last decades, the number of hot days above 30°C has already more than doubled in Vienna, and future scenarios suggest further strong increases depending on global climate policy.

We assume that the prevailing wind directions will remain broadly similar, with a dominance of winds from the north and west and significant components from the south and southeast, which together offer good potential for cross ventilation through the building. At the same time, rainfall is expected to occur less frequently but in more intense events, with individual storms already delivering record amounts of precipitation in short periods and heavy rainfall becoming measurably stronger in Austria.

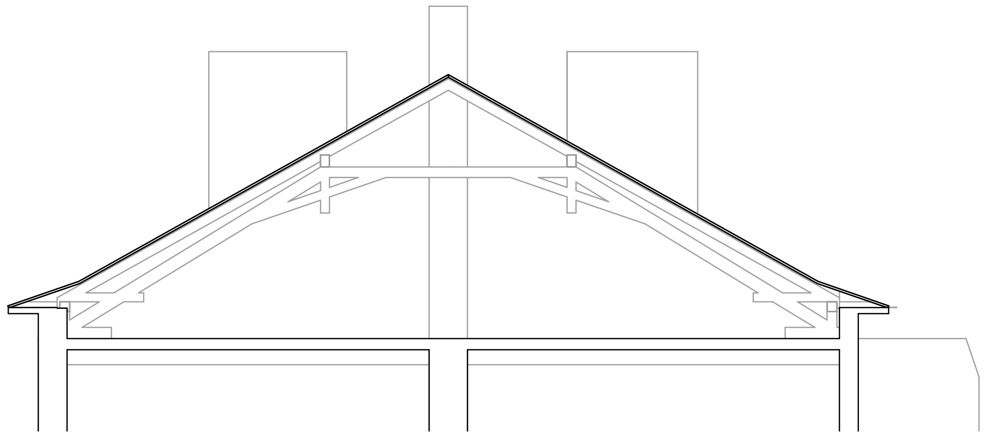
[1] Global Wind Atlas. Global Wind Atlas. Accessed April 22, 2026. https://globalwindatlas.info

CURRENT STRUCTURE



Current attic floor plan

The existing attic is currently unused and uninsulated. It functions simply as an air buffer between the top floor apartments and the exterior, but without any deliberate climatic design. In winter, the space provides minimal protection, as there is no thermal insulation and only a thin separation between conditioned rooms and outside air. In summer, the attic becomes a heat trap: solar radiation heats the roof tiles, warm air accumulates, and, with no effective ventilation, the stored heat radiates down into the dwellings below. In its present state, the attic is therefore an inefficient and largely passive volume, yet it holds considerable potential to be transformed into an active climatic and spatial resource.



Current attic section

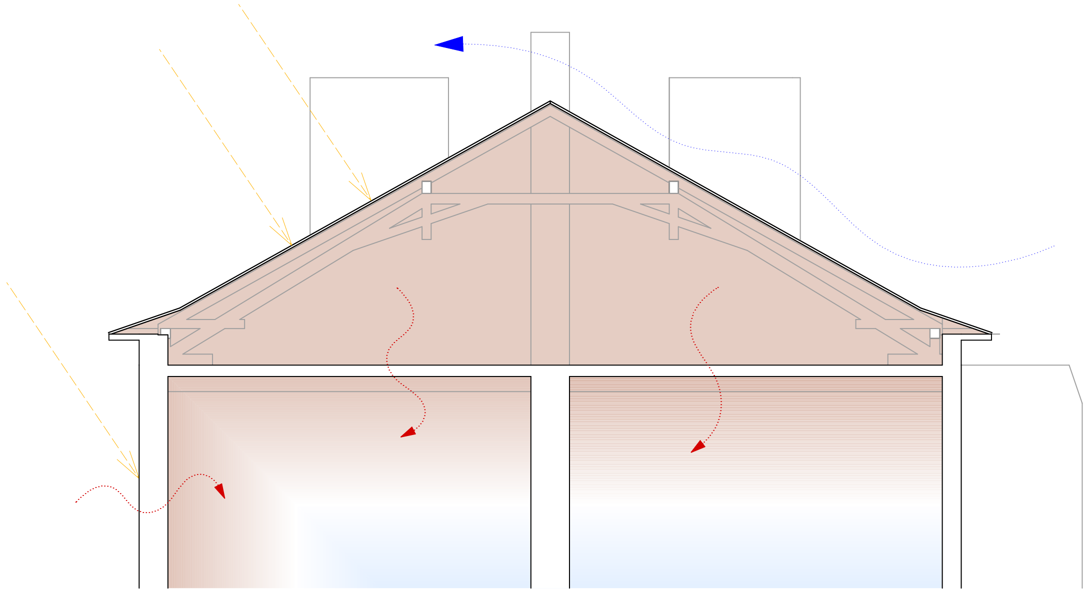


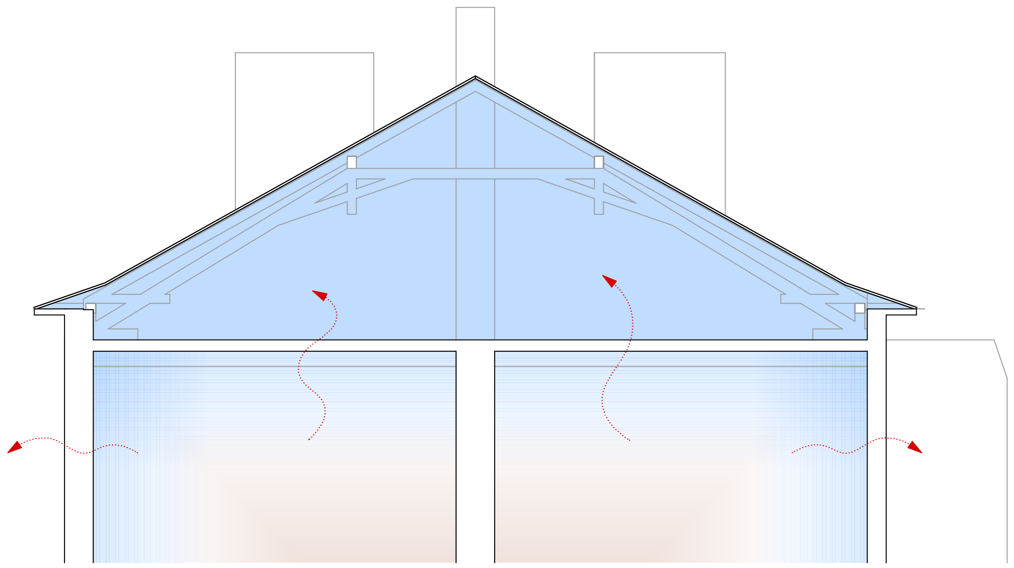

1.existing roof stucture
2.existing roof covering
3.existing stucture chimneys
4.existing window

The existing attic is defined by a raw and exposed timber structure, consisting of repetitive trusses, beams and rafters that shape the spatial character of the space. The construction is robust but minimal, with no additional layers for insulation or climatic control. The roof covering, made of overlapping tiles, sits directly above the timber structure without a ventilated or insulated buildup. The masonry chimney and perimeter walls remain untreated, revealing cracks and material ageing. This exposes the load-bearing system but also highlights the lack of thermal performance.

Spatially, the attic is a continuous, open volume structured by the timber frame. However, the steeply sloping roof significantly reduces the usable height, leaving only a narrow central zone where standing is possible. Towards the edges, the space becomes very low and difficult to occupy, limiting both movement and potential use. As visible in the section, this compression reinforces the attic's role as a residual volume rather than a functional living area.
Climatically, the attic performs poorly. In summer, the tiled roof absorbs and stores solar radiation, causing warm air to accumulate within the enclosed volume, with no effective ventilation to remove it. In winter, the absence of insulation allows heat to escape from the apartments below, while cold air penetrates the space. As a result, the attic functions as an uncontrolled climatic buffer rather than a protective or usable environment.

Current thermal issue - winter





With the current structure, solar radiation heats up the roof surface and the air inside the attic during hot summer days, leading to significant heat build up. Because the attic is neither ventilated nor insulated, this heat is transferred almost directly to the apartments below. There are no effective cooling airflows across or through the attic, so warm air remains trapped and the space stays hot long after peak radiation. As a result, the attic slightly but persistently heats the top floor apartments and delays their cooling at night, since the stored heat continues to radiate down into the living spaces instead of being removed by ventilation.

During winter, the problem is essentially reversed. Because the attic is not insulated, heat from the top floor apartments escapes through the ceiling into the cold attic volume. At the same time, cold air from the attic leaks down into the living spaces, lowering indoor temperatures. This leads to higher heating demand, energy inefficiency and reduced thermal comfort for the residents.

Current thermal issue - summer

Current thermal issue - winter

The existing attic and roof are highly underutilised: they provide almost no usable space and act mainly as an uncontrolled air volume.

Thermally, the system performs poorly: in summer it traps heat and radiates it into the top floor, in winter it lets heat escape and cold air leak down, increasing energy demand and discomfort.

Vienna is moving towards a significantly warmer and more extreme climate: higher average temperatures, many more hot days and longer heatwaves.

Dry, hot periods and intense rainfall events will both increase, which means roofs must handle overheating and water management at the same time.

RESEARCH QUESTION

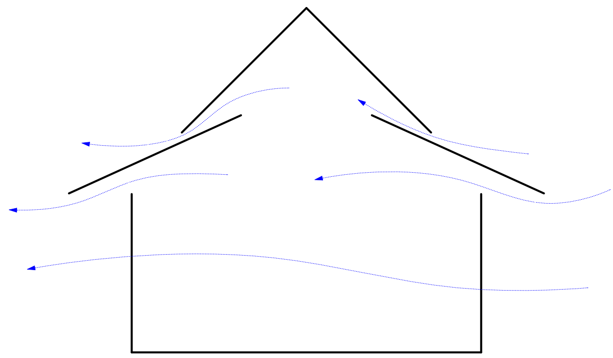
How can a roof in Vienna act as a divice that combines thermal regulation, temporal adaptability of use, and resilient rainwater management under changing climatic conditions?

REFERENCES

This chapter introduces the architectural and climatic references that underpin the project. Each example shows how roofs and roof-adjacent spaces can respond to heat, moisture, solar radiation and seasonal change. The references highlight strategies such as ventilation, layering, shading, evaporative cooling and transitional spaces between inside and outside. They are not models to be copied, but precedents from which transferable principles are derived. The chapter then links these precedents to the specific situation in Vienna, where Dachgeschossausbau and local building culture frame how roofs can be rethought as climate-responsive systems. and adaptive envelopes to turn the roof into an active, adaptive system within the existing urban fabric.

Malay House - Roof

The traditional Malay house roof shows how architecture can directly respond to a hot-humid climate. It is designed for continuous airflow, quick drying, and protection from strong sun and heavy rain. Large overhangs, lightweight materials, and a permeable structure turn the roof into a climatic filter that keeps interiors shaded and well ventilated.
Its steep form and deep overhangs protect façades and openings, allowing windows to remain open even during rain and enabling constant cross-ventilation. Beneath the outer layer, bamboo and timber—with low thermal mass—prevent heat storage and cool quickly after sunset. Gaps in the construction and the porous thatch support airflow: warm air rises and escapes, drawing cooler air in from below.
Rather than resisting climate through mass, the Malay roof manages it through openness and airflow, acting as a dynamic interface between inside and outside. As a reference, it highlights principles of breathable and adaptable roof systems relevant for Vienna's future summers, though additional measures are needed for winter.

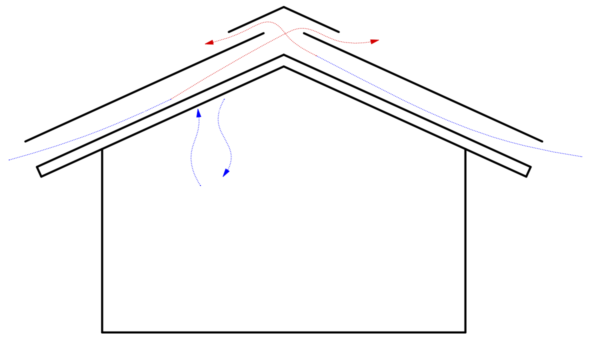


Malay House - Scheme

[1] Kamal, et al. "Climatic Design of the Traditional Malay House to Meet the Environmental Conditions of Malaysia." The Malaysian Surveyor 40, no. 1 (2006). https://anzasca.net/wp-content/uploads/2014/08/ANZAScA2004_Kamal.pdf
[2] "Adaptation Design of Traditional Malay House to Meet the Environmental Conditions of Malaysia." Building Conservation Blog, March 3, 2007. http://buildingconservation.blogspot.com/2007/03/adaptation-design-of-traditional-malay.html

Cham House - Roof

The double roof system of Cham houses in Vietnam is a highly refined response to a hot-humid tropical climate characterized by strong solar radiation, heavy rainfall, and minimal diurnal temperature variation. Unlike systems relying solely on ventilation or mass, this roof combines both through a layered approach.
The key strategy lies in the separation of roof layers, creating a ventilated buffer zone. The upper roof shields the building from direct solar gain and rain, while the lower roof—often incorporating some thermal mass—slows down heat transfer. The air gap between these layers is crucial: as the upper roof heats up, the air within this cavity warms, rises, and escapes through openings at the top, creating a stack effect. This continuous airflow removes heat before it reaches the interior. In the context of the research question, the Cham roof exemplifies a roof as an active climatic device, integrating thermal regulation through both time delay (mass) and heat extraction (ventilation). It also allows for temporal adaptability, as the degree of ventilation can vary depending on environmental conditions. Regarding rainwater, the outer roof acts as a protective layer, ensuring robust water management while maintaining airflow.
For Vienna, this principle is highly transferable: a double-skin roof with controlled ventilation could provide summer cooling while being adapted (e.g. closable cavities) for winter insulation, making it a strong model for a hybrid, climate-responsive roof system.

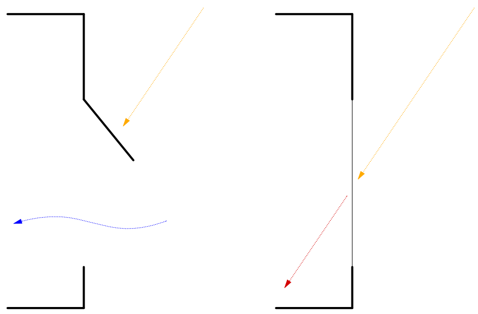


Cham House - Scheme

[1] Birkeland, Janis, and Nur Demirbilek. "Applying Environmentally Responsive Characteristics of Vernacular Architecture to Contemporary Design." PDF. https://www.irbnet.de/daten/iconda/CIB_DC22717.pdf
[2] Quintin Lake. "Cham House, Vietnamese Museum of Ethnology, Hanoi | Geometry & Silence." Geometry & Silence, June 16, 2010. https://blog.quintinlake.com/2010/06/16/cham-house-vietnamese-museum-of-ethnology-hanoi/

Glaced Loggia

The glazed loggia, commonly found in Mediterranean regions such as Spain, operates as a seasonally adaptable intermediate space between interior and exterior. In climates with hot summers and relatively cool winters, the challenge lies in balancing heat protection with solar gain.
The loggia functions as a buffer zone that changes its behavior throughout the year. In summer, external shading devices (such as blinds) are deployed while windows remain open, transforming the space into a shaded, ventilated balcony that prevents direct solar gain and promotes airflow. In winter, the system reverses: blinds are raised and windows closed, allowing solar radiation to enter and be trapped, creating a greenhouse effect that preheats the air before it reaches the interior.
This dual functionality directly addresses the research question by demonstrating how a roof-adjacent element can provide thermal regulation through seasonal transformation. It introduces a clear concept of temporal adaptability of use, as the space shifts from an outdoor extension in summer to a thermal buffer in winter. While not primarily designed for water management, the enclosed façade and overhangs contribute to basic rain protection and controlled exposure.
For Vienna, the glazed loggia suggests the potential of roofs as programmable climate layers, where adjustable systems (open/closed, shaded/exposed) allow buildings to respond dynamically to seasonal changes, combining passive heating and cooling within a single architectural element.



Glaced Loggia - Scheme

[1] Jure Grohar, Eva Gusel, Maša Mertelj, Anja Vidic, and Matic Vrabič, eds. +/– 1 °C: In Search of Well-Tempered Architecture. Ljubljana: Museum for Architecture and Design (MAO), 2023

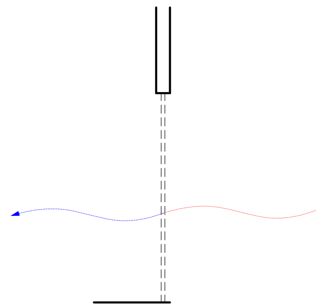
Evaporative Cooling System

Low-Energy Air Conditioner (Ant Studio, New Delhi)
The low-energy cooling system developed by Ant Studio in New Delhi reinterprets vernacular principles of evaporative cooling using contemporary design. In a hot climate context, the system uses terracotta cones and water to reduce air temperature without mechanical energy.

The strategy is based on evaporative cooling: water is distributed over porous clay elements, which absorb and slowly release it. As the water evaporates, it extracts heat from the surrounding air, reducing temperatures by approximately 6–10 °F (≈3–6 °C). The material choice is crucial—terracotta is both porous and thermally responsive, enabling efficient moisture exchange and cooling.

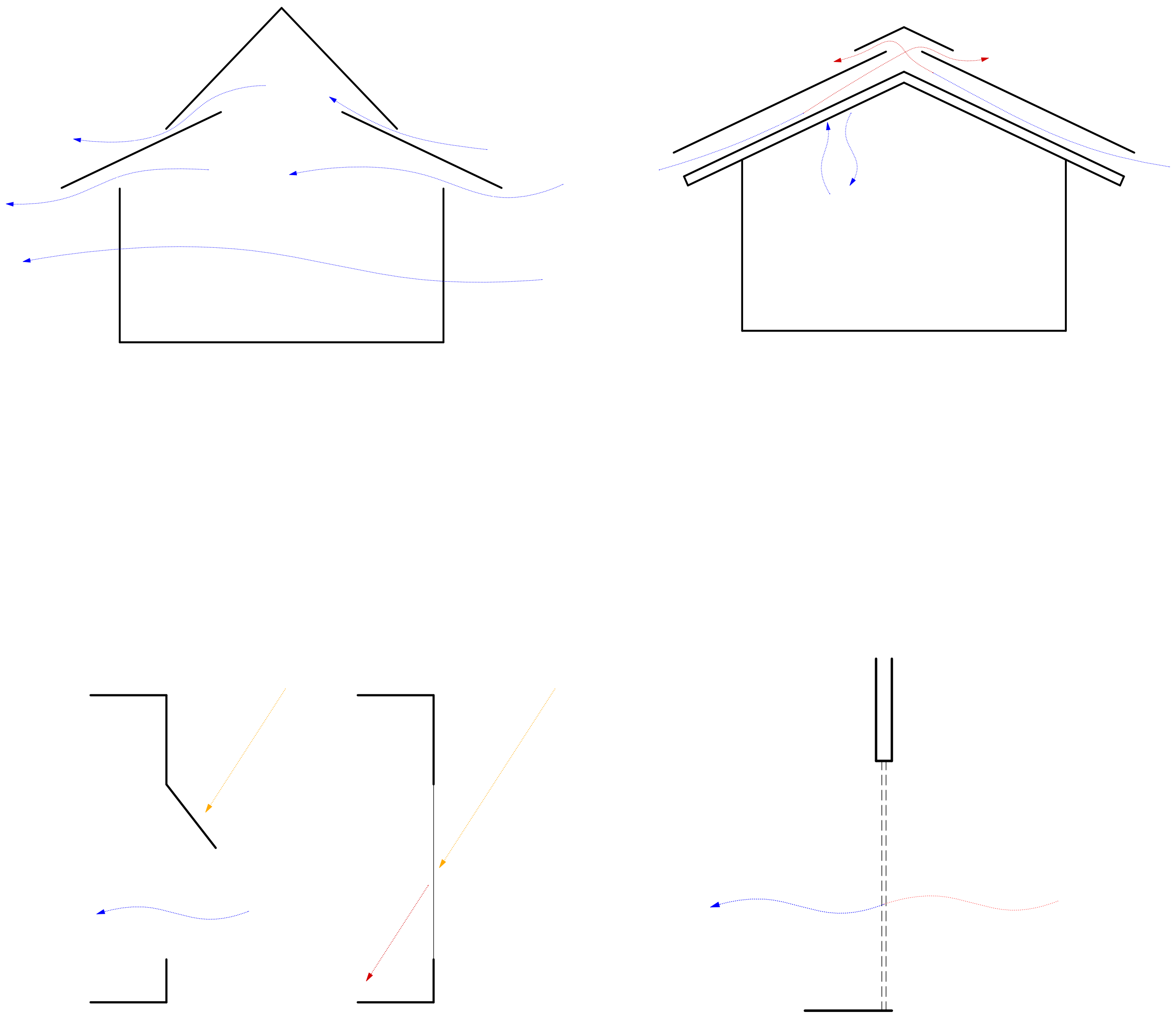
In relation to the research question, this system highlights how a building element can act as a microclimatic device, actively modifying temperature through material properties and natural processes. While not a roof in itself, the principle can be integrated into roof structures as a cooling layer, especially in combination with ventilation. It also introduces a form of temporal adaptability, as the system can be activated or deactivated depending on climate conditions. Additionally, it implies a connection to water management, where collected rainwater could be reused for cooling processes.

For Vienna, this suggests the integration of evaporative cooling layers within roof systems, potentially combining rainwater harvesting with passive cooling—transforming the roof into a multifunctional environmental regulator.



Evaporative Cooling - Scheme

[1] "Ant Studio." Lung Lung Design, 2017. http://lunglungdesign.blogspot.com/2017/10/ant-studio.html



1.Malay House - Scheme
2.Cham House - Scheme
3.Glaced Loggia - Scheme
4.Evaporative Cooling - Scheme

THE KEY PRINCIPLES OF REFERENCE ARE VENTILATION, THERMAL MASS AT A DOUBLE ROOF, SEASONAL ADAPTABILITY AND EVAPORATING COOLING.

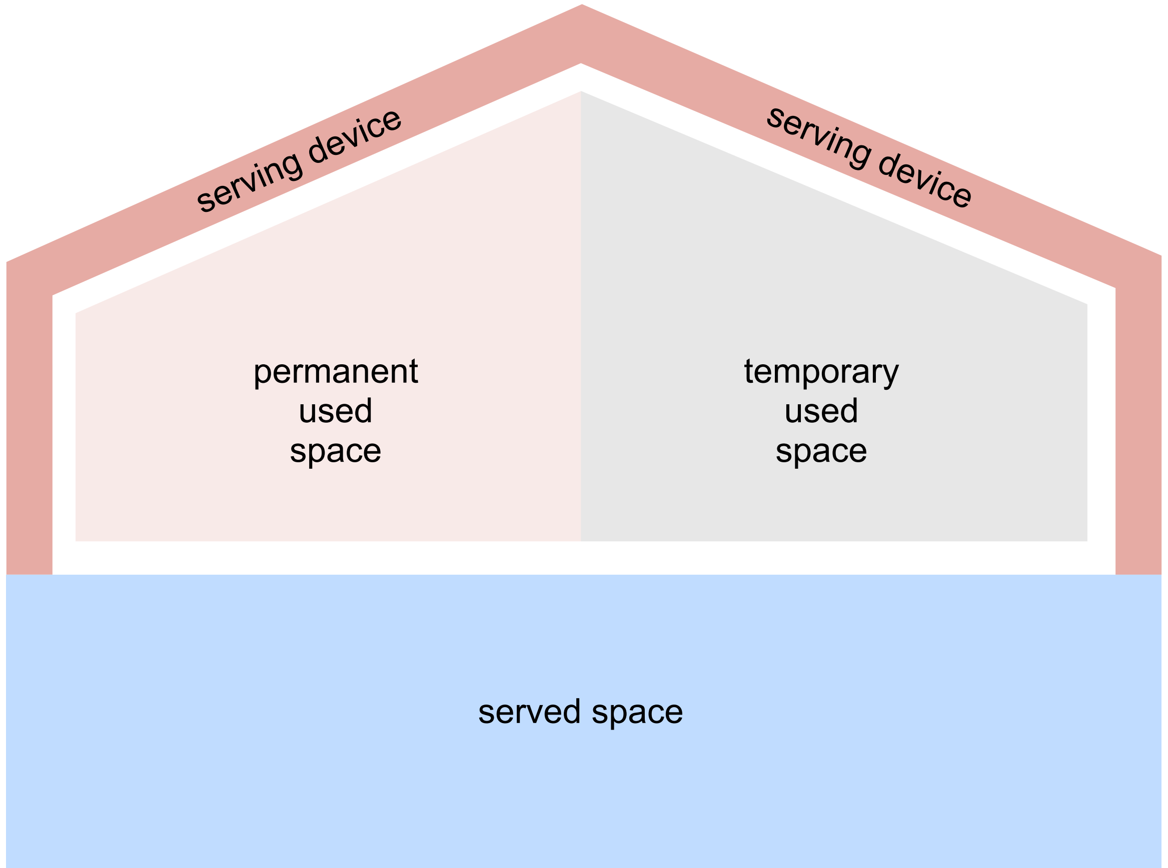
1. Mariahilfer Straße 182 - Leyrer + Graf
2. Falkestraße - Coop Himmlblau
3. attic conversion - haas architecture
4.Pyrkergasse - obenauf

The architectural context of Vienna is strongly shaped by its dense Gründerzeit fabric and the extensive development of Dachgeschossausbauten (attic conversions). Since the late 20th century, these interventions have transformed previously unused roof spaces into valuable living areas, contributing to urban densification without expanding the city footprint. As a result, the roof in Vienna has already evolved from a purely protective element into a habitable and economic resource. While these strategies improve spatial quality, they also lead to increased vulnerability to overheating, particularly under future climate conditions. The typical Viennese roof—whether steep, mansard, or flat—was not originally conceived as a climatic regulator, but rather as a structural and formal component. This creates a gap between existing building culture and emerging environmental demands. The Viennese context highlights both a challenge and an opportunity:
The existing practice of Dachgeschossausbau provides the structural and typological basis, but requires a transformation in approach. Instead of only maximizing enclosed volume, future interventions must integrate ventilation layers, shading systems, and adaptive solutions.

STRATEGY

Our key Principles are...

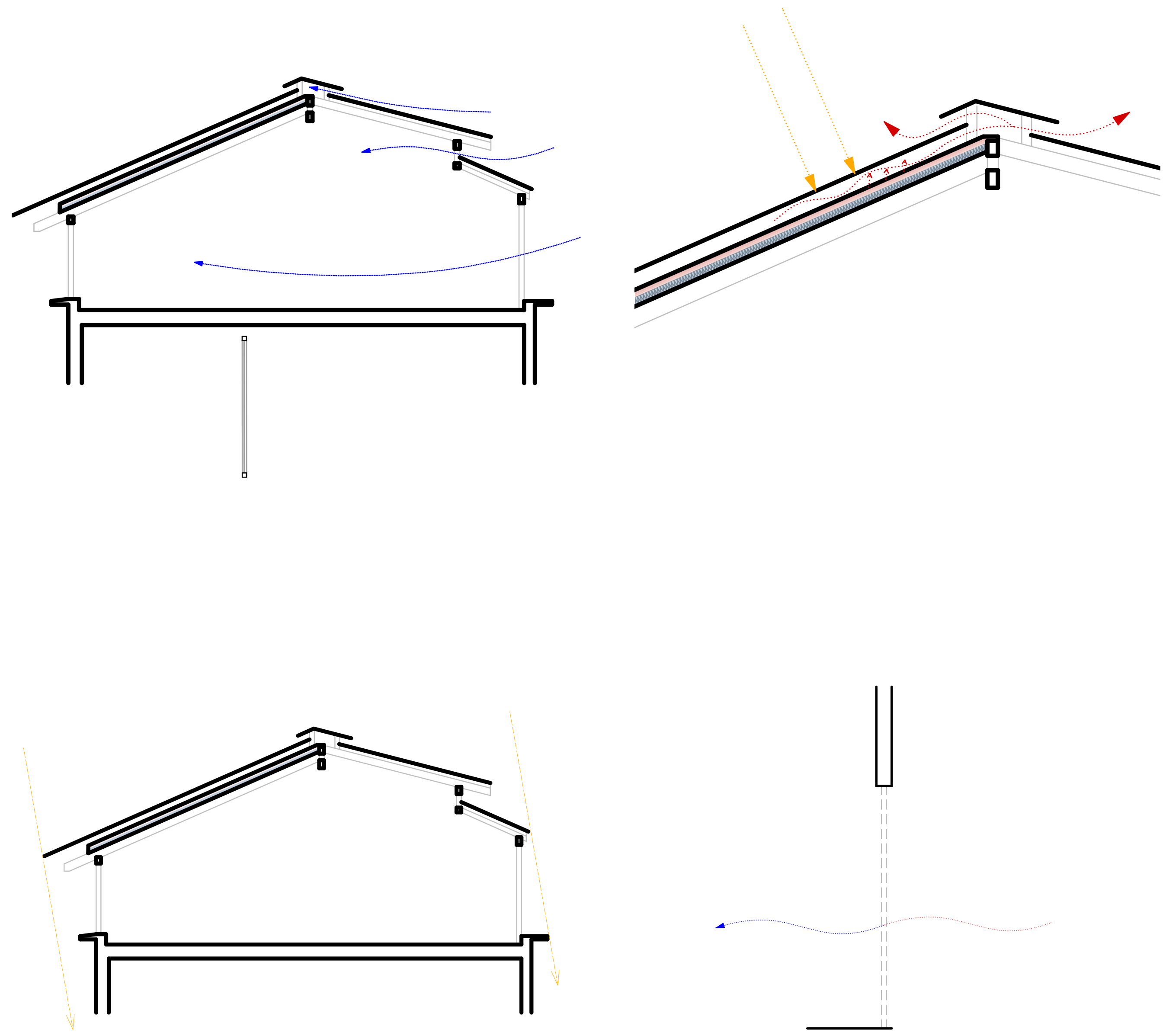
...a double roof system as a cooling device adapting to seasonal changes.



Serving and Served Spaces

Our key Principles are...

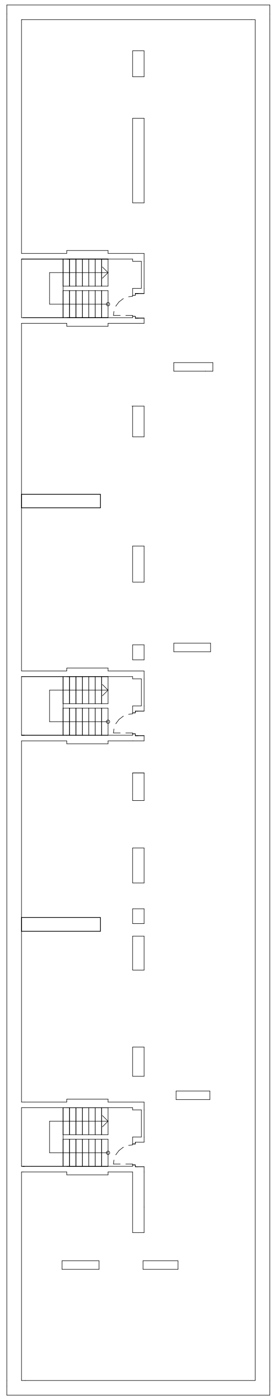
...a double roof system as a cooling device, adapting to seasonal changes. Utilising ventilation, thermal mass, overhangs and evaporation.



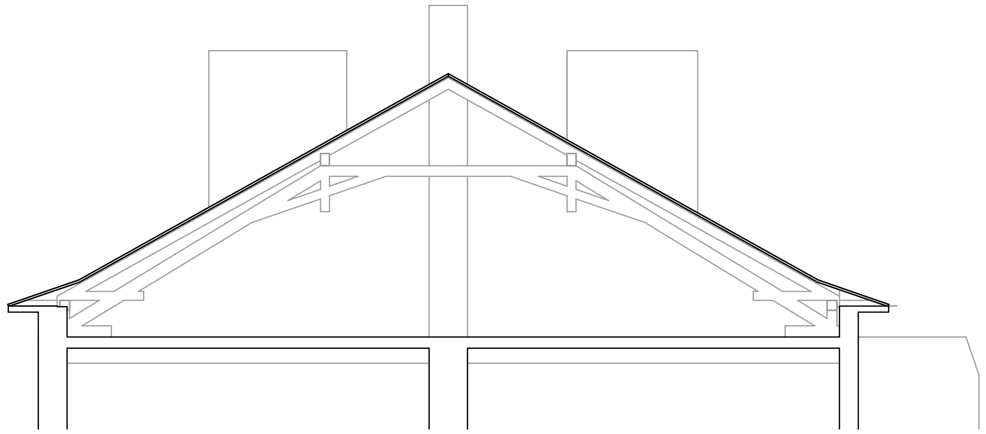
1.Ventilation
2.Double roof / Heat exhaustion
3.Shading
4.Evaporative Cooling

PROPOSAL

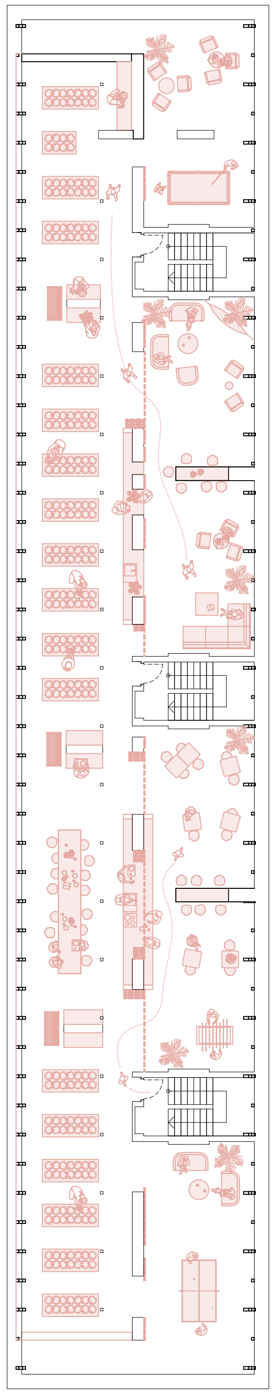
The proposal transforms the existing attic from a passive, uninsulated buffer into an active climatic device that mediates between interior and exterior conditions. Instead of a static protective layer, the intervention introduces a multi-layered and adaptable system that responds to seasonal changes, enabling both cooling in summer and heat retention in winter.
At its core, a double roof structure introduces a ventilated cavity between the outer weather layer and the inner thermal layer. In summer, solar heat is reduced through continuous airflow via openings at the eaves and ridge, removing warm air before it reaches the interior. In winter, this system is partially closed, limiting heat loss and transforming the roof into an insulating envelope. Clay-based layers increase thermal inertia, while straw insulation improves resistance to cold and moisture.
A second key element is the introduction of a programmable intermediate space beneath the roof. This space acts as a seasonal extension of the apartments and can shift between an open, ventilated environment in summer and a protected, enclosed buffer zone in winter. Sliding and folding partitions allow users to adapt the degree of openness, creating a gradient between interior and exterior rather than a fixed boundary.
Rainwater is integrated as part of the climatic system. The roof collects and stores water, which is reused for evaporative cooling through porous brick surfaces, linking water management with thermal regulation.
Materially, the proposal builds on locally available and low-tech resources such as timber, clay and straw. These materials are combined in layered assemblies that are breathable, repairable and adaptable over time. Existing structural elements are reused where possible, reducing material consumption while maintaining continuity with the existing building fabric.
Overall, the proposal redefines the roof as an active environmental interface. By combining ventilation, thermal mass, adaptable spatial use and water-based cooling, it addresses the overlapping challenges of overheating, energy efficiency and climatic uncertainty. The roof becomes not only a protective element, but a performative system that enhances both environmental performance and everyday living conditions within the building.



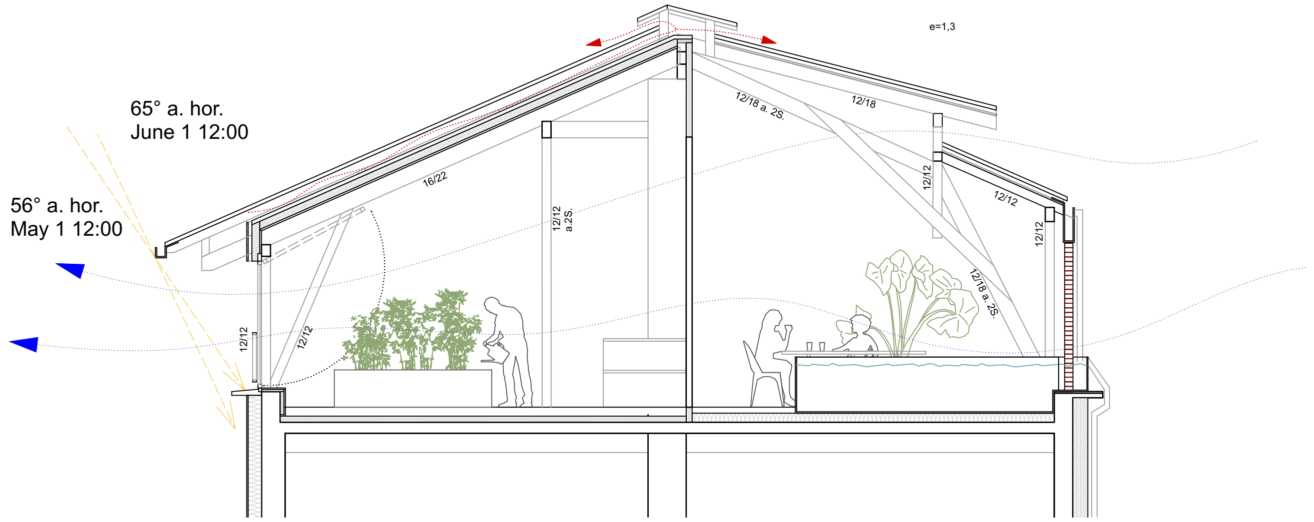
Current floor plan



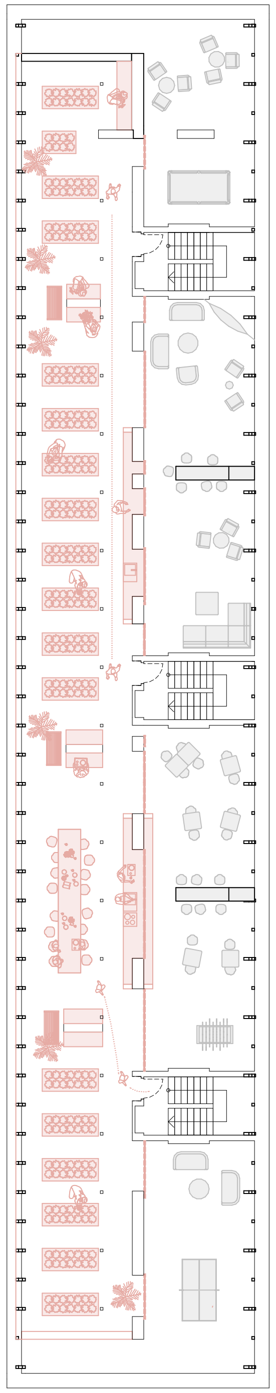
Current section

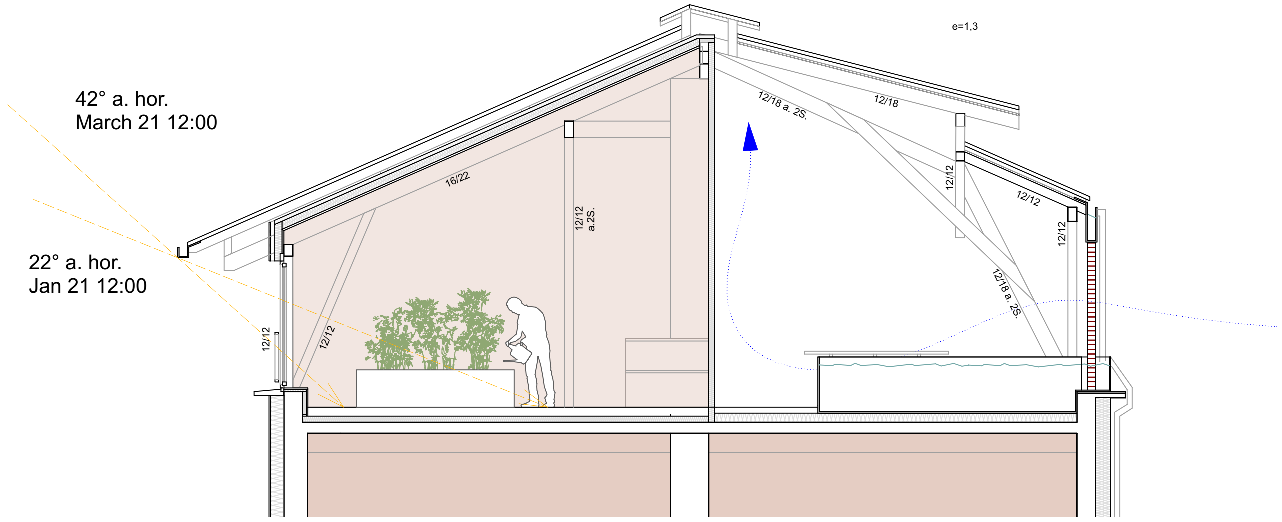


New floor plan - summer



New section - summer

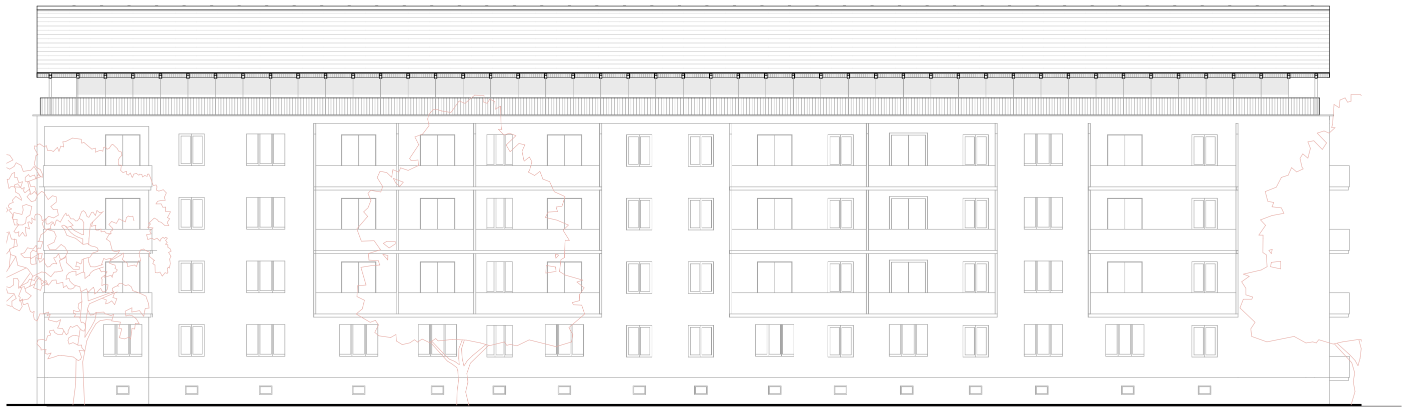




New floor plan - winter

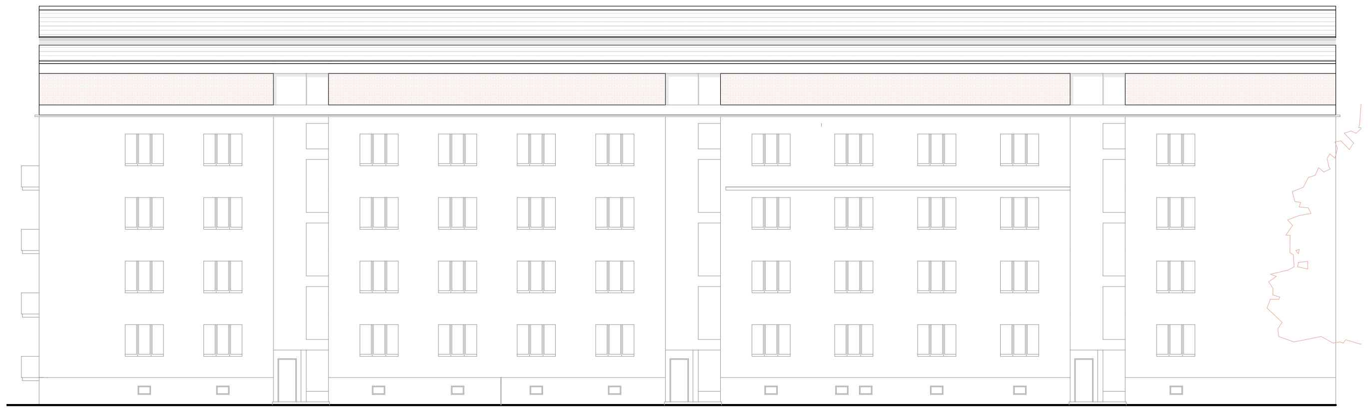
New section - winter

Current south facade

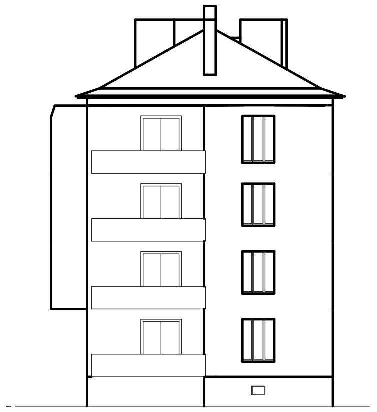


New south facade

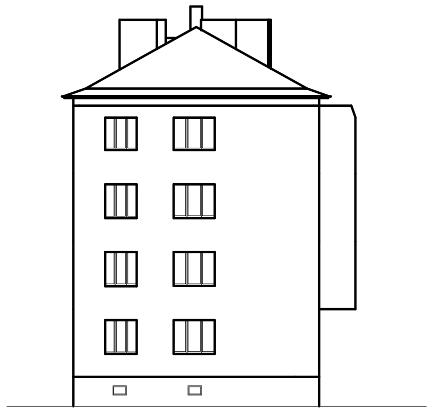
Current north facade



New north facade



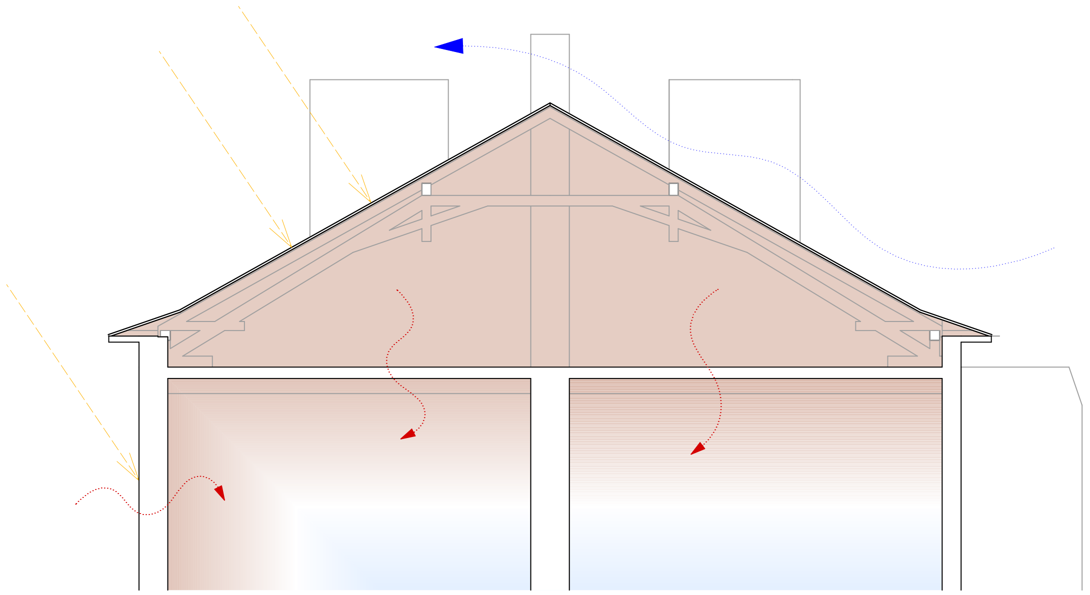
Current east facade



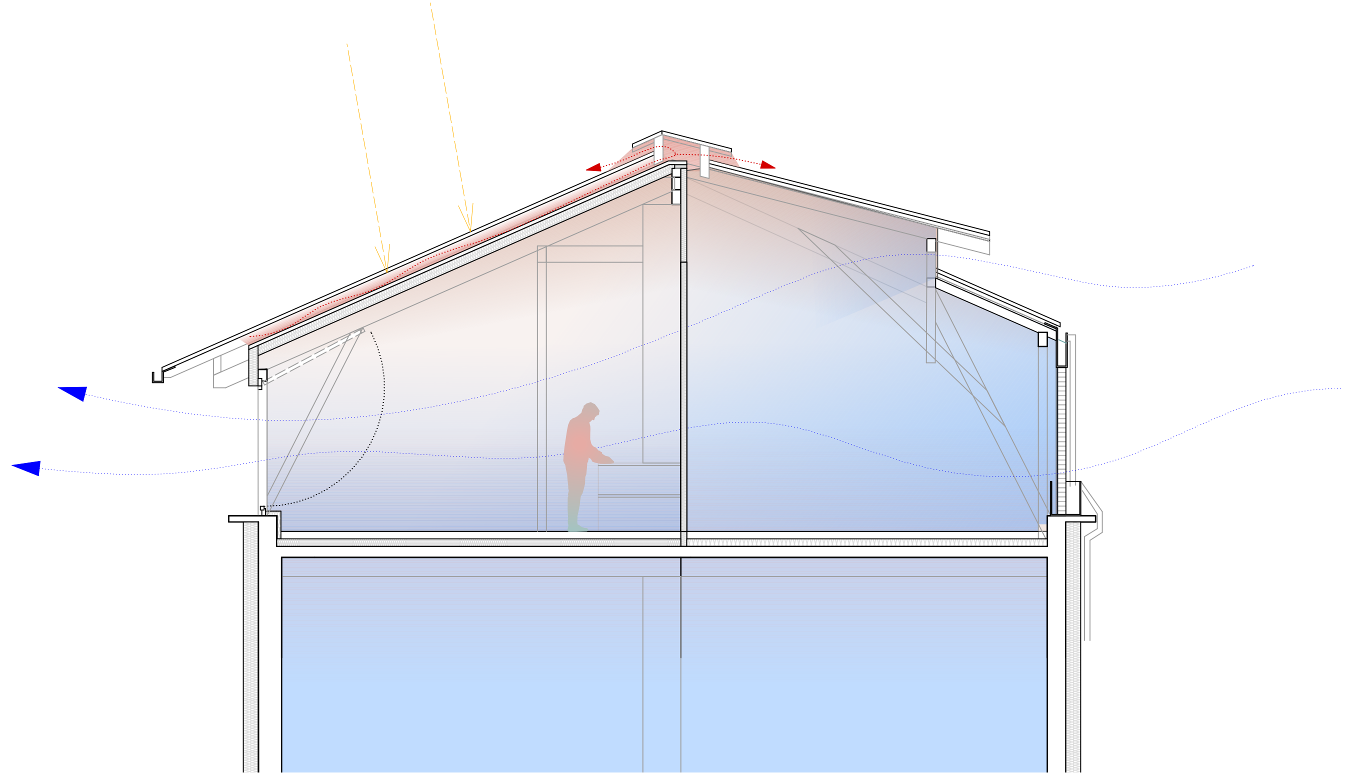
Current west facade

New east facade

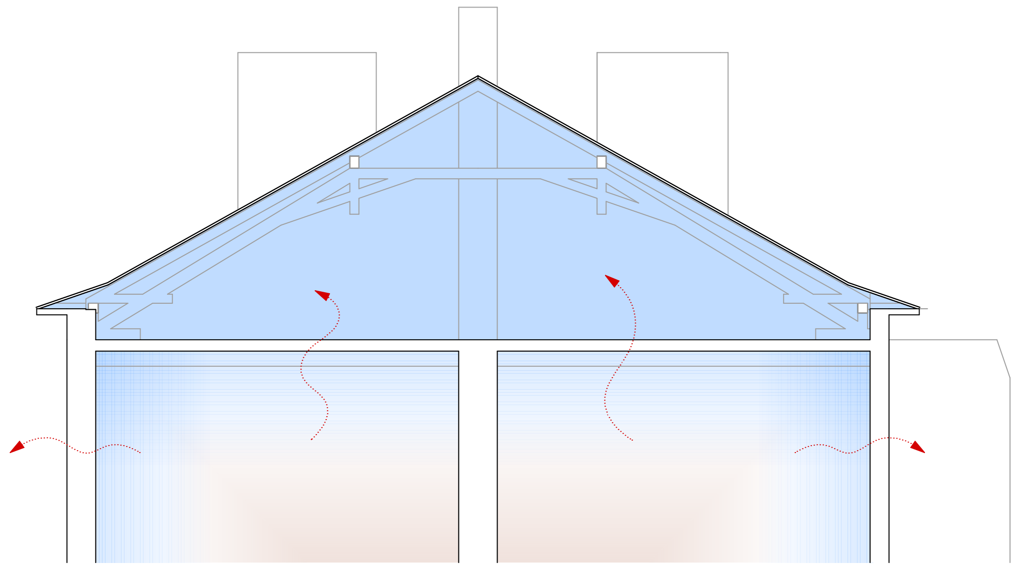
New west facade



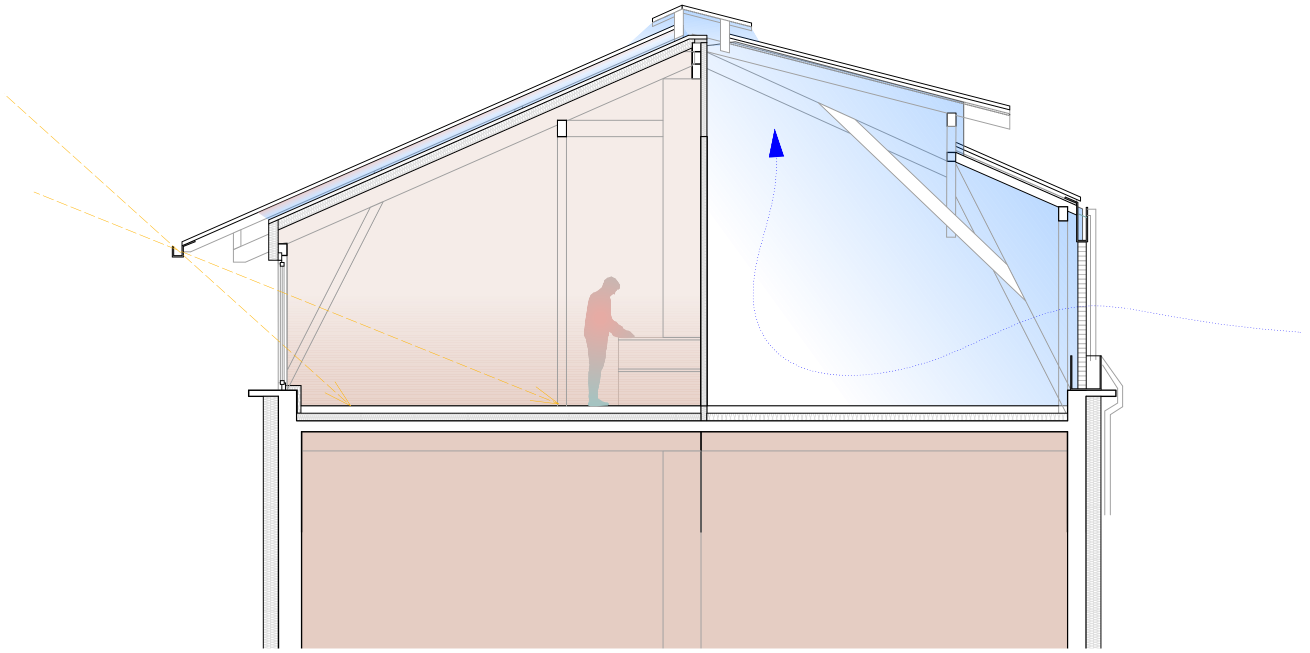
Climate scheme summer, current



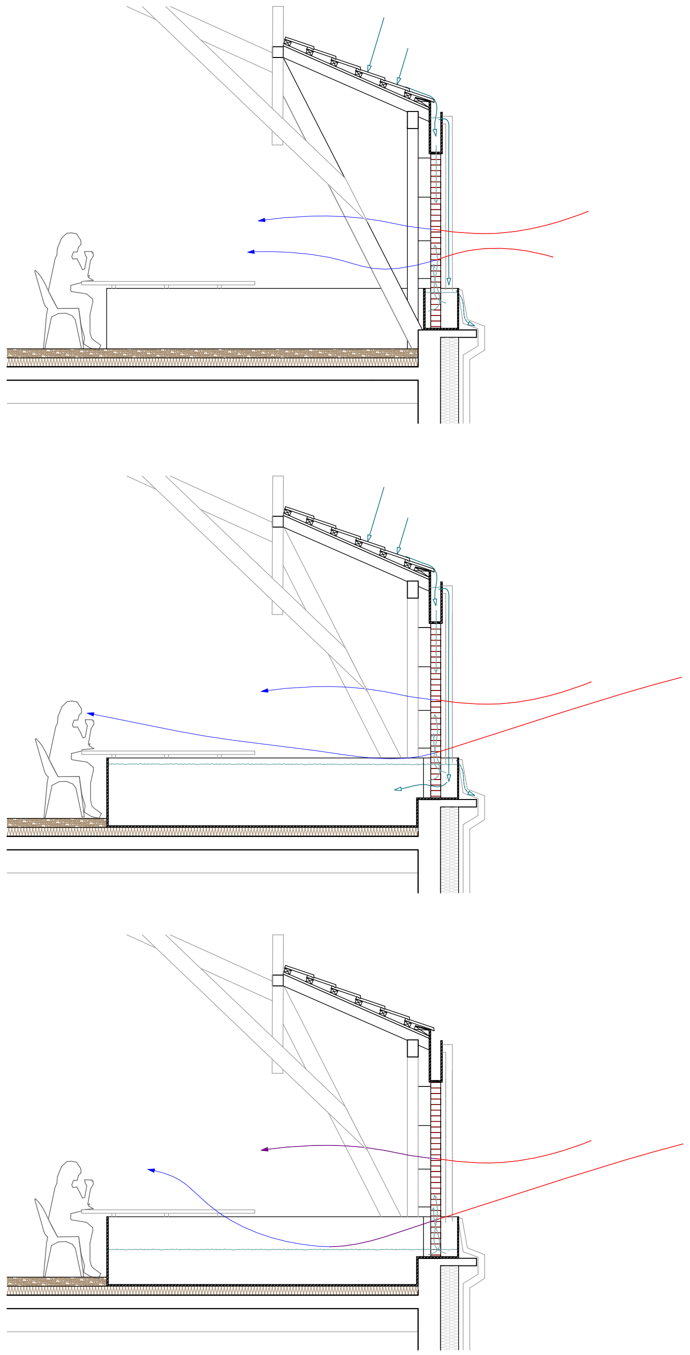
Climate scheme summer, new



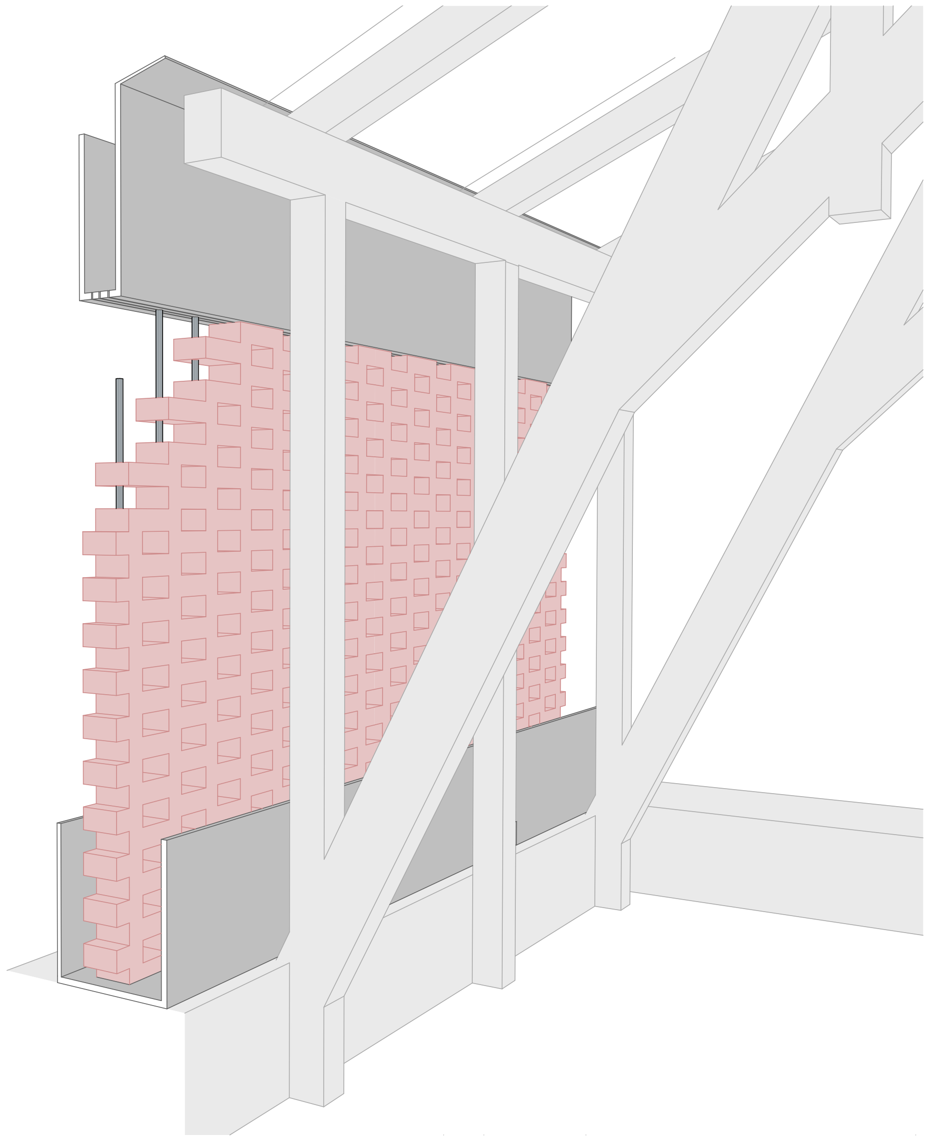
Climate scheme winter, current



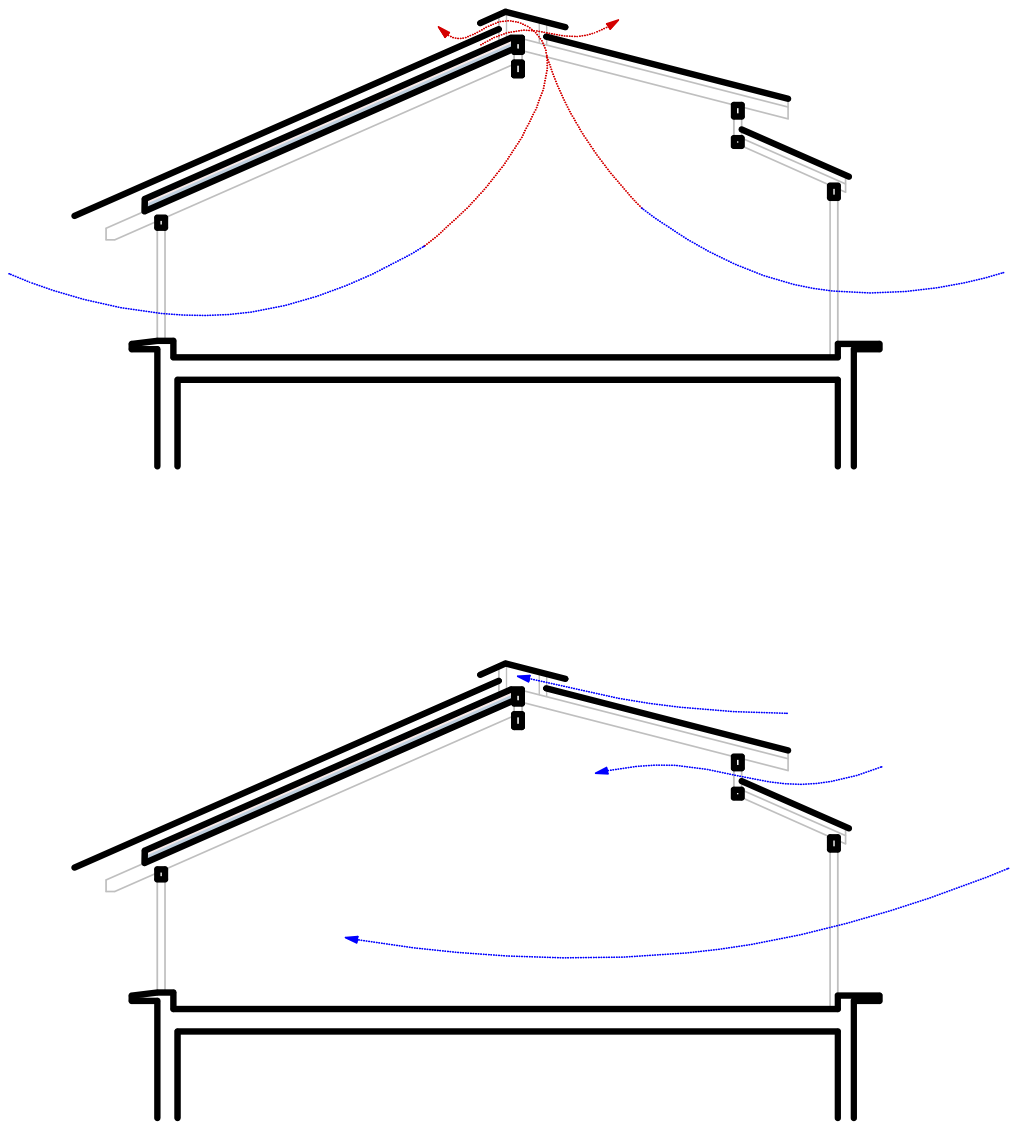
Climate scheme winter, new



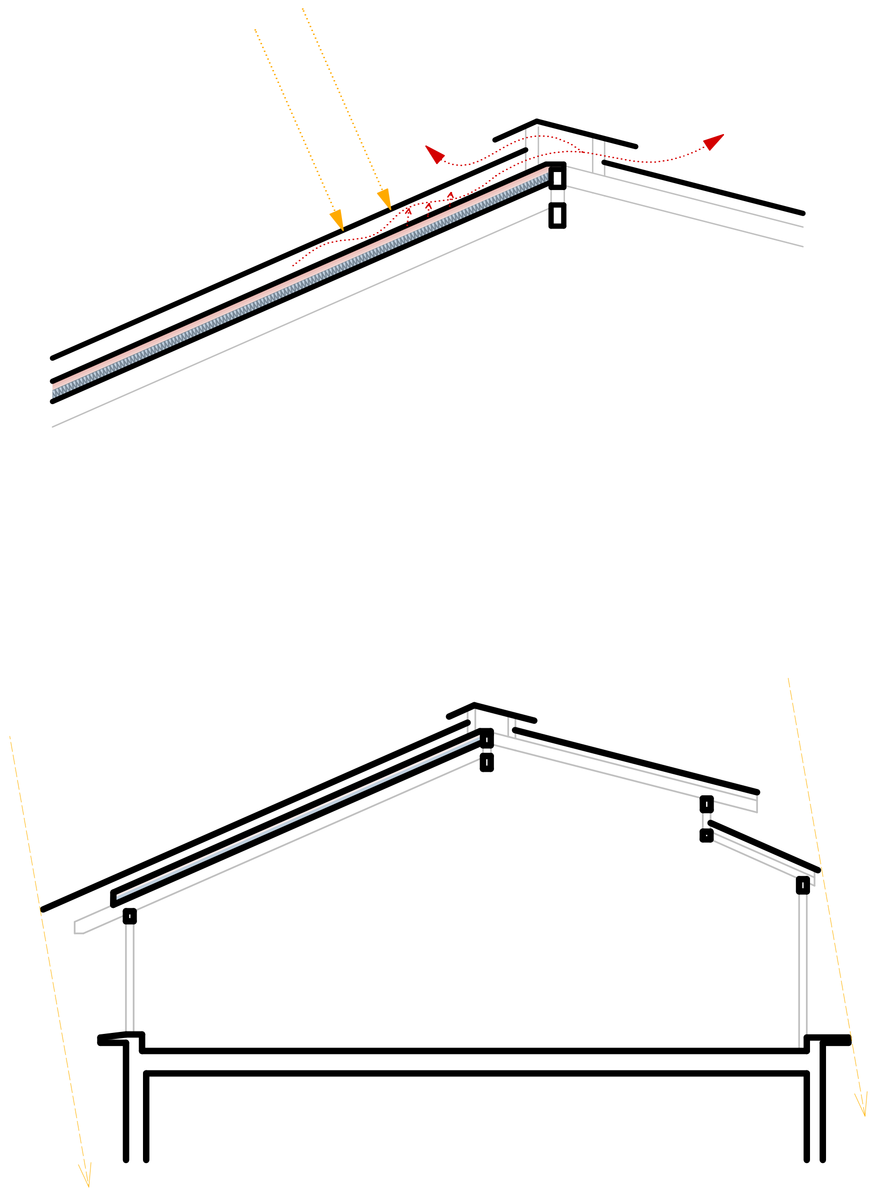
Water retention for passive cooling



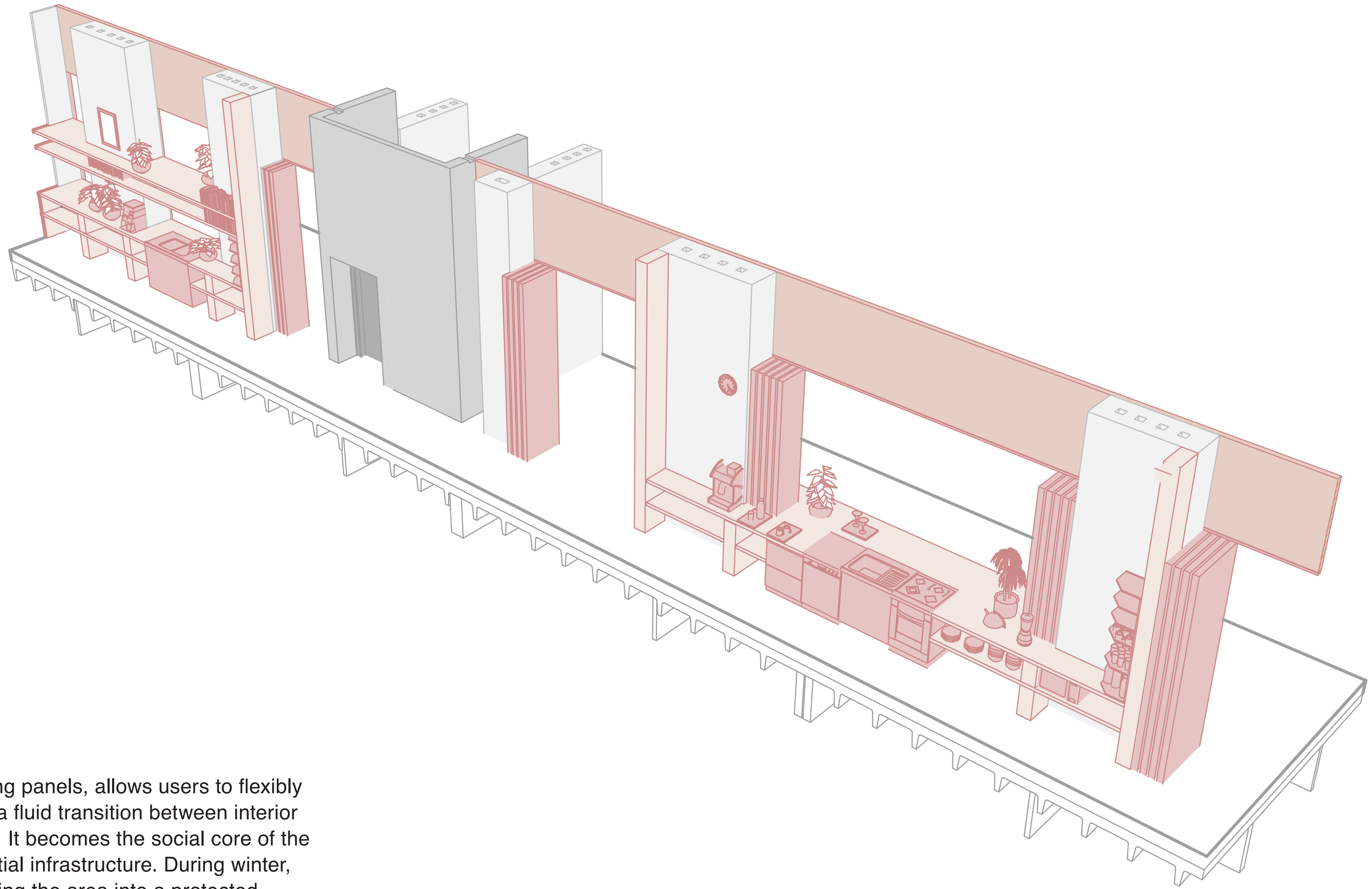
The strategy is based on evaporative cooling: water is distributed over porous clay elements, which absorb and slowly release it. As the water evaporates, it extracts heat from the surrounding air and reduces temperatures.



Heat exhaustion and cross ventilation

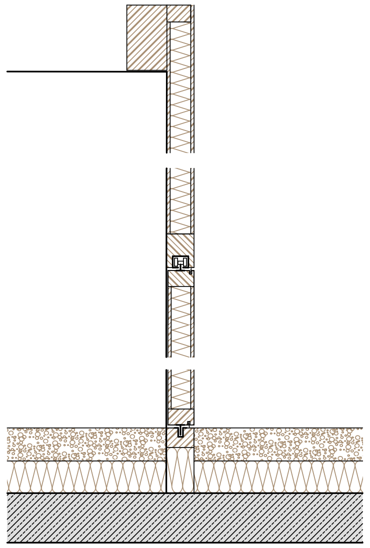


Double roof and roof overhang

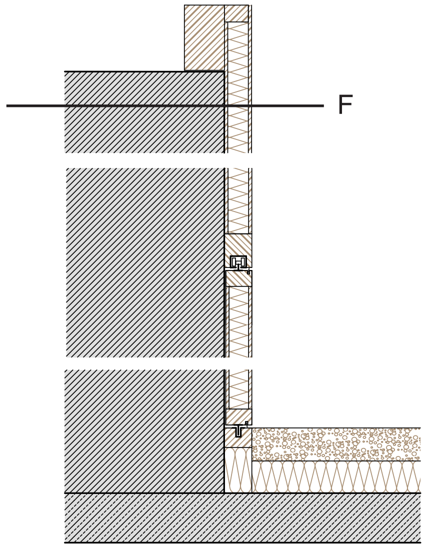


The partition wall, together with the folding panels, allows users to flexibly adjust the degree of openness, creating a fluid transition between interior and exterior rather than a rigid boundary. It becomes the social core of the space, integrating the kitchen and essential infrastructure. During winter, the panels can be fully closed, transforming the area into a protected indoor environment.

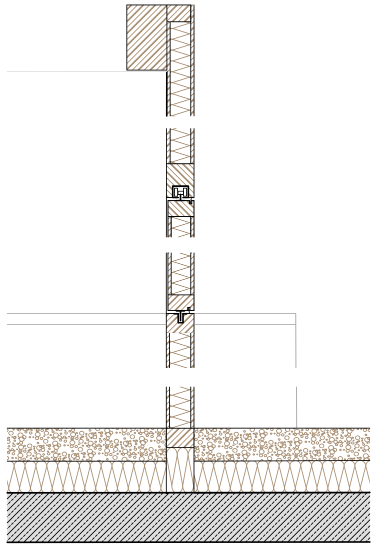
Partition wall perspective



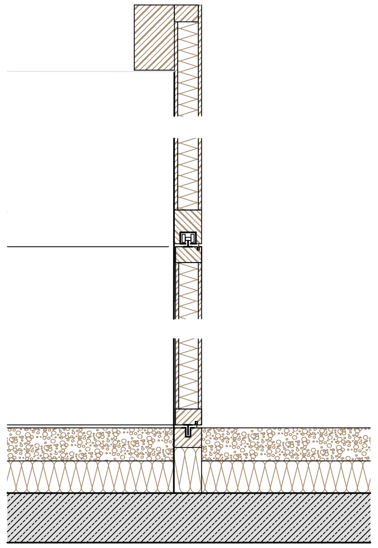
1 Sliding door



2 Sliding door



3 Folding door

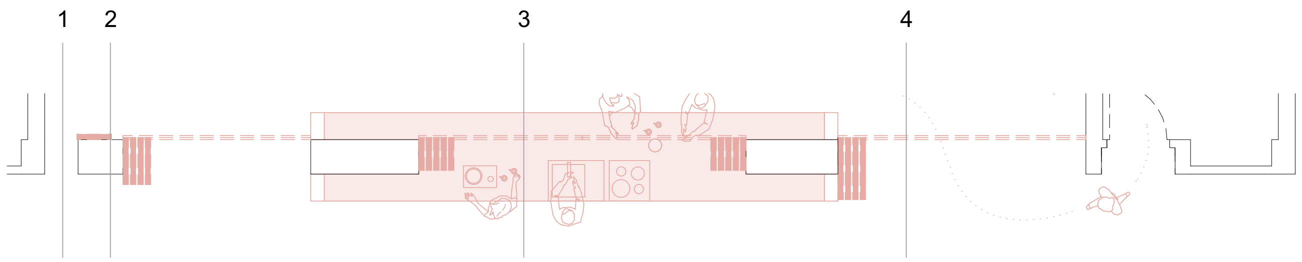


4 Folding door

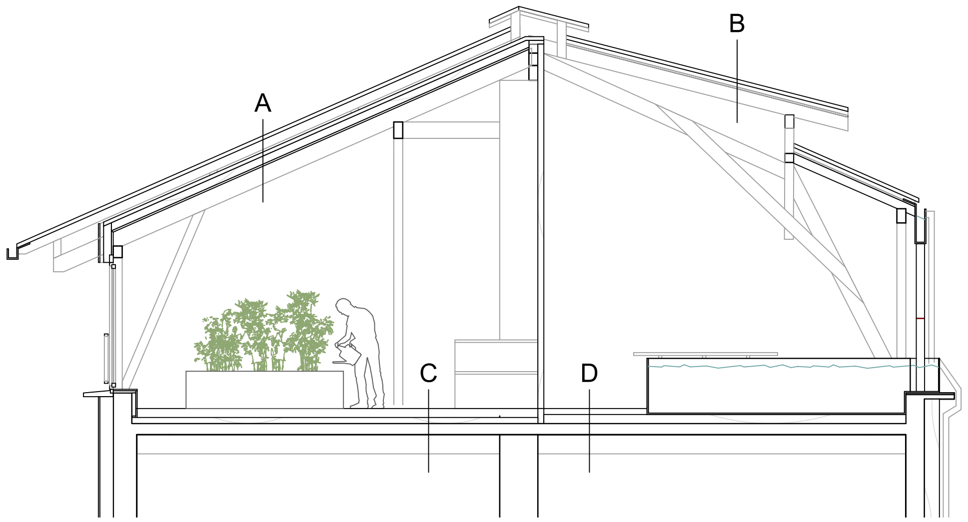
Sliding and folding door detail

F - Partion wall buildup

50,0 cm	(existing brick wall)
1,0 cm	wood panel
7,0 cm	straw insulation
1,0 cm	wood paneel



Detail siting



Statik und Bauphysik ermittelt nach:

[1] Wolfgang M. W., Schild K. Dinter S., Stricker D. in Formeln und Tabellen Bauphysik 2.Auflage Vieweg+ Teubner I GWV Fachverlage GmbH, Wiesbaden 2010

[2] Bernard T., Korjenic A., Bednar T. in Bautechnisch, ökologiesche und ökonomische Grundlagen der Planung von Strohballen-Gebäuden - Literaturzusammenstellung und Analyse des thermischen Leitwertes der Gebäudehülle, Ersnt und Sohn Verlag für Architektur und techinsche Wissenschaft GmbH & Co KG Bauphysik 36, 2014

[3] Tavoussi K., Fadai A., Petrusic S., Tragwerksslehre Besmessungstabellen, Technische Universität Wien, Institut für Tragwerksplanung und Ingenieurholzbau, 2015

[4] Schroeder H., Lehmbau Mit Lehm ökologisch bauen 3.Auflage, Springer Vieweg, 2019

[5] Austrian Standards International, Önorm B1991-1-1, 2020

A - Inertia Double Roof

	interlocking roof tiles
3/5 cm	battering
5/8 cm	raised counter battering
15,0 cm	inbetween ventilation layer
7,0 cm	clay thermal mass
0,5 cm	reet-mat
10,0 cm	straw insulation inbetween wooden substructure
3,0 cm	clay acoustic panel
16/22 cm	solid timber beam

B - Ventilation Roof

	interlocking roof tiles
3/5 cm	battering
3,0 cm	clay accustic panel
16/22 cm	solid timber beam

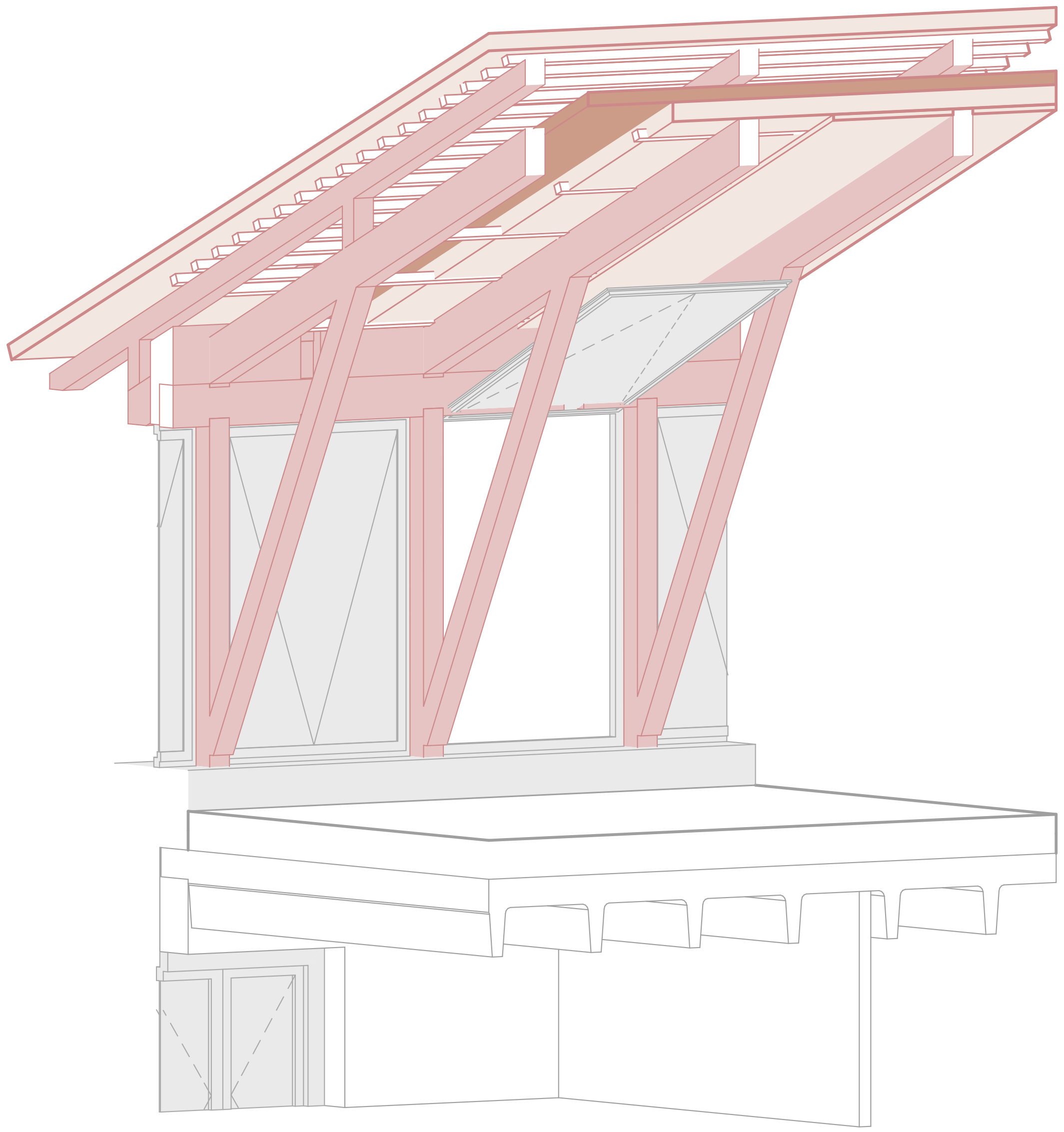
C - South Floor

10,0 cm	polished clay tiles
12,0 cm	straw insultion
	vapor barrier
15,0+20,0 cm	ribbed reinforced concrete slab

D - North Floor

6,0 cm	polished clay tiles
16,0 cm	straw insultion
	vapor barrier
15,0+20,0 cm	ribbed reinforced concrete slab

Roof and floor assemblies



Inertia double roof

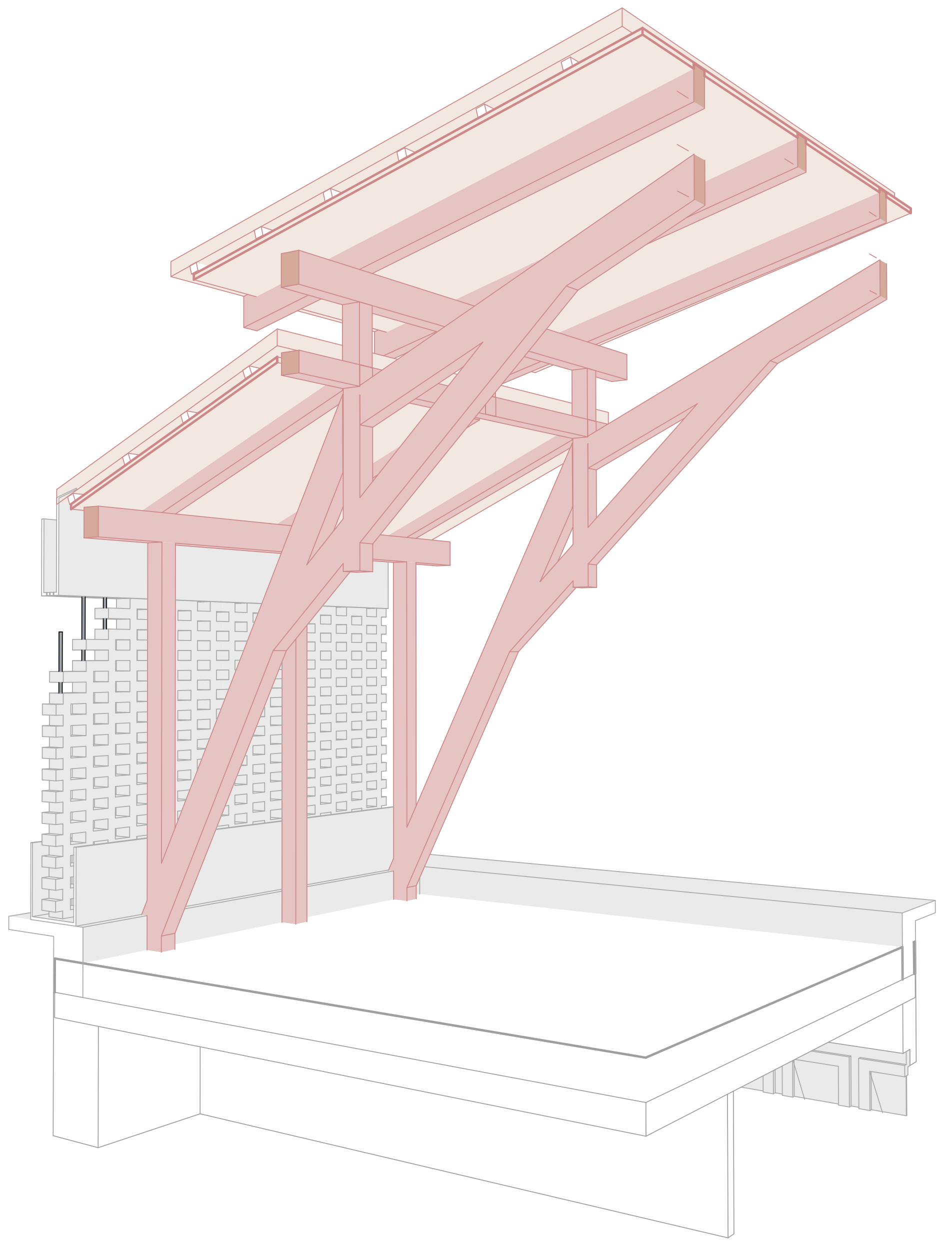
A - Inertia Double Roof

	interlocking roof tiles
3/5 cm	battering
5/8 cm	raised counter battering
15,0 cm	inbetween ventilation layer
7,0 cm	clay thermal mass
0,5 cm	reet-mat
10,0 cm	straw insulation inbetween wooden substructure
3,0 cm	clay acoustic panel
16/22 cm	solid timber beam

C - South Floor

10,0 cm	polished clay tiles
12,0 cm	straw insultion
	vapor barrier
15,0+20,0 cm	ribbed reinforced concrete slab

Roof and floor assemblies



Roof constuction

B - Ventilation Roof

	interlocking roof tiles
3/5 cm	battering
3,0 cm	clay accustic panel
16/22 cm	solid timber beam

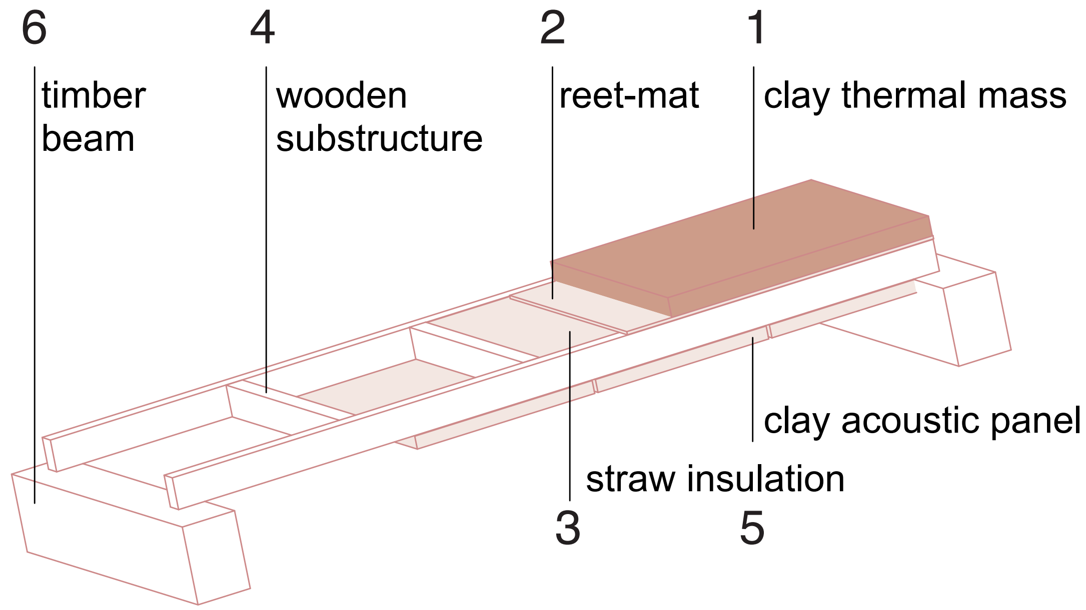
D - North Floor

6,0 cm	polished clay tiles
16,0 cm	straw insultion
	vapor barrier
15,0+20,0 cm	ribbed reinforced concrete slab

Material sample

A - Inertia Double Roof

	interlocking roof tiles
3/5 cm	battering
5/8 cm	raised counter battering
15,0 cm	inbetween ventilation layer
7,0 cm	1 - clay thermal mass (wet clay, sand, straw mixture)
0,5 cm	2 - reet-mat
10,0 cm	3 - straw insulation inbetween
	4 - wooden substructure
3,0 cm	5 - clay acoustic panel
16/22 cm	6 - solid timber beam



Material sample scheme

Material sample acoustic panel

B - Ventilation Roof

	interlocking roof tiles
3/5 cm	battering
3,0 cm	clay acoustic panel
16/22 cm	solid timber beam

Clay acoustic panel
Japanese Knotweed and Loam Panel

The sound panel is made of two layers combining Wiener Tegel and Japanese knotweed. The lower layer uses a denser mixture with finely chopped knotweed, while the upper layer contains larger knotweed pieces, which enhance the panel's acoustic properties.

Material sample acoustic panel

material sample floor tile

C - South floor

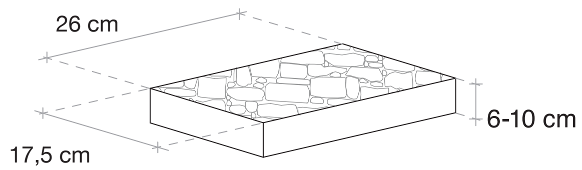
10,0 cm	polished clay tiles
12,0 cm	straw insultion
	vapor barrier
15,0+20,0 cm	ribbed reinforced concrete slab

D - North floor

6,0 cm	polished clay tiles
16,0 cm	straw insultion
	vapor barrier
15,0 cm 20,0 cm	ribbed reinforced concrete slab

Polished Rammed Earth Tile
Prefabricated

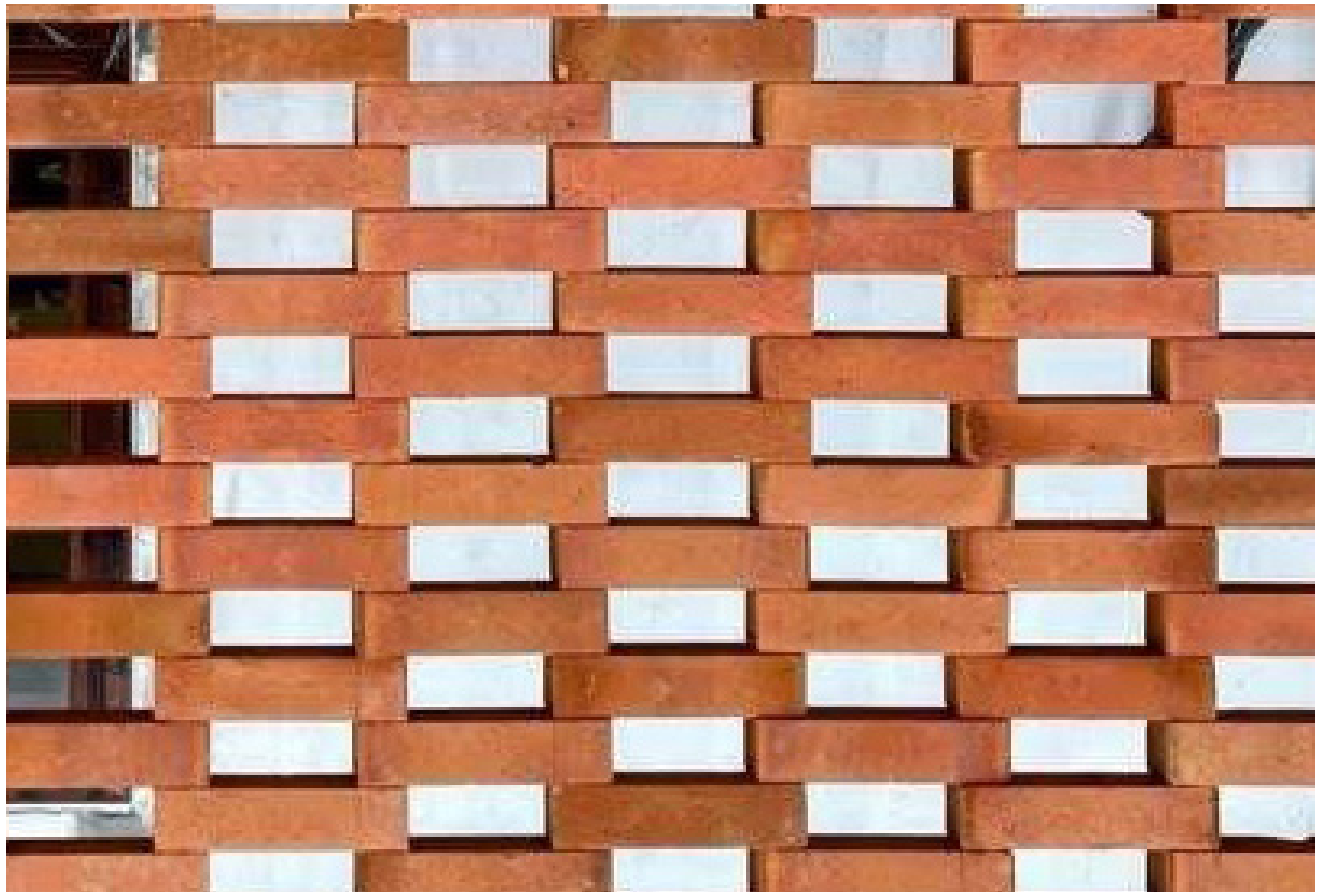
The rammed earth mixture were put into the formwork and rammed until compressed. After that the surface was polished with a sanding machine at different grits until smooth. After the tiles were dry, the surface was oiled multiple times with linseed oil for protection. The tiles are placed on the sound insulating layer and the joints are filled with a damp clay mixture.



material sample floor tile

Seperating walls - kitchen
10 cm clay bricks (wet clay, sand, straw)
This mix has a high ratio of fine sand, resulting in a dense and relatively smooth consistency. It is easy to work with and holds its shape well during forming. A small amount of straw improves internal cohesion without affecting the surface finish. The mixture is ideal for creating clean, sharp-edged elements.

material sample clay brick



Evaporating brick wall
10 cm reused burned clay bricks

material sample brick

existing beams

reuse of existing beams

Athmosphere Summer

Athmosphere Winter

working model

working model

in partnership with