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Matthew Phillips, Nelly Pilz, Franziska Singer
(eds.)

**Anatomy of Change.
Architecture and Time in Ticino**

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Temporary, circular, permanent – strategies for the existing building stock

- From temporary to circular to permanent – strategies for dealing with the building stock according to different requirements
- Included projects address key issues such as climate change, demographic shifts, and resource use

The combined, interconnected forces of climate, demographic, and economic change are resulting in profound and unpredictable changes in architecture, landscape, and urban space.

At the same time, there is a demand for resilient, sustainable architecture. However, our buildings are becoming less and less durable. The structures we build are often too rigid to adapt to changing needs. As a result, the use determines the lifespan of a building and not the other way around.

If time and duration are understood as decisive factors in sustainable architecture, this requires a change in approach. This is examined in the publication.

Ticino is an ideal area for research issues that affect Switzerland and Europe as a whole, as it is particularly affected by these changes. It has a unique microclimate, a widespread infrastructure network, access to construction and energy resources, diverse migration flows, and a rich cultural heritage.

Over the course of three semesters, students at ETH Zurich developed projects with different time horizons – from temporary, circular to permanent – that address central aspects of the Ticino territory: climate change, an aging demographic, and resource use. In doing so, they open up new strategies for dealing with architectural transformation processes.

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At a fundamental level, the publication understands change as a constitutive element of resilience, documenting the projects comprehensively with plans, construction details, architectural models, artistic images and collages. This effectively illustrates not only the specific projects but also their underlying design ideas and highlights how the narrative is key to communicating new strategies.

About the editors

The six authors work at the Chair of Elli Mosayebi at ETH Zurich while also pursuing their own projects:

Elli Mosayebi is a partner at EMI Architekt*innen.

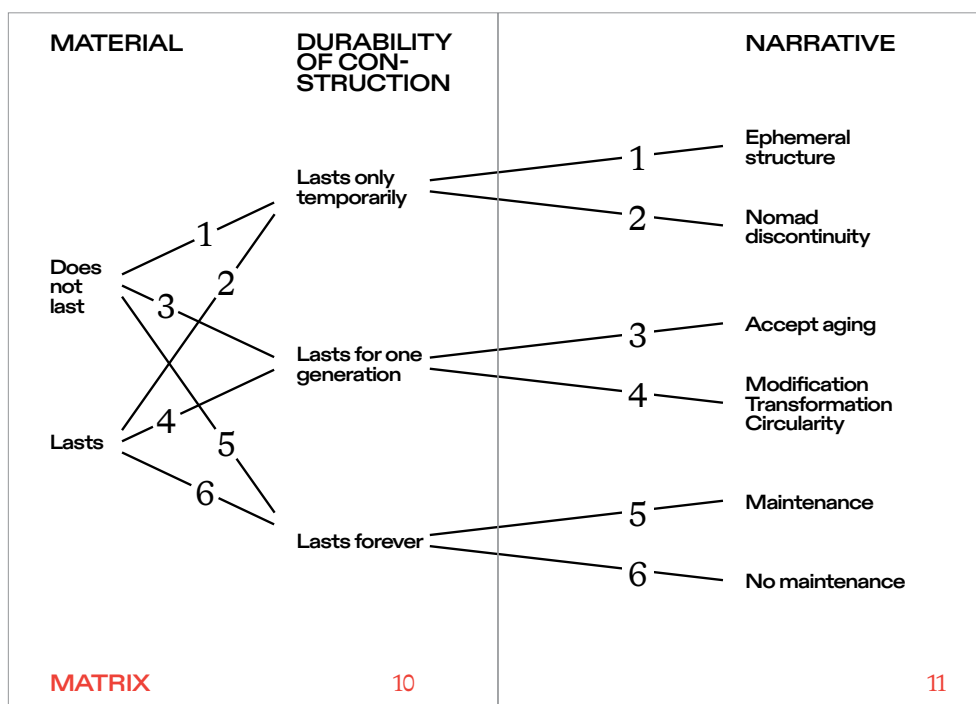
Violeta Burckhardt has her own landscape architecture firm studio erde.

Julian Meier also has his own architecture studio.

Matthew Phillips heads the interdisciplinary studio HSZJN398.

Nelly Pilz and her firm studiopilz work on projects at the interface between architecture and art.

Franziska Singer has her own firm with a special focus on transformation.



- The most radical way to minimize our ecological footprint is to eliminate permanent lodging. Instead, individuals remain in continuous movement, carrying only the essentials. Their migrations align with seasonal rhythms, shifting between summer and winter quarters in response to environmental conditions.

- Architecture is an unstable assemblage of materials (Ákos Moravánszky), bound for a certain period of time. Without maintenance and renewal, every building is exposed to the forces of nature and will eventually deteriorate. What if deterioration is an integral part of the architectural intention? How do we plan deterioration?

- Until the mid-20th century, the paradigm was to extend the service life of buildings. According to Uta Hassler, early concepts of prefabrication took into account the ability to dismantle and reuse building components, thus emphasizing physical permanence (Hassler 2011). The idea of buildings as repositories of materials is not new; historically, it has been driven by economic considerations and resource efficiency.

This narrative follows a simple principle: one house build for one generation! Since the longevity of construction methods often falls short of the durability of the materials themselves, projects are created as tailored responses to transient needs. In this view, buildings become provisional constellations in an ongoing cycle of disassembly and recomposition.

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to change. Can architecture meet the challenges?

A WALKING CITY

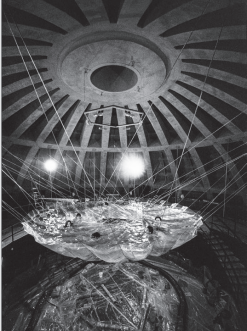
Illustration by *James G. Thompson*

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**Drought
(Hydrant)**

The *Hydria* project by Oscar Lussi and Jan Zimmermann also responds to extreme conditions to address issues of water supply and demand. During the summer months in Ticino, as temperatures ascend, accelerated evaporation reduces the amount of water stored within soils, rivers and lakes. In Switzerland, drought is defined as a prolonged period during which less than one millimeter of precipitation is recorded at a weather station. This phenomenon transforms landscapes and disrupts the lives of their inhabitants. In 2022, Switzerland saw its lowest rainfall since local measurements began, and between June and August of that year, less than 40 percent of the expected rain fell in the country's southernmost regions. Increased heat waves, lack of rainfall, sunshine duration, higher temperatures and lower relative humidity that the region is now experiencing create the perfect climatic variables that lead to drought and forest fires – a common occurrence in this region and a threat to the local flora and fauna. When this extreme situation occurs, as it did in Centovalli in 2022, large fires can rage for days. The heavy rainfall that the region routinely experiences in the late summer and autumn is




Water submersed inside the dome of ETH Zurich, 1985.
Temporary receptacles for water as social infrastructures

countered by the drought conditions in the late winter and early summer months, when forest fires are most likely to occur. The discrepancy between water resources and the lack of infrastructure to reach these remote forest regions makes emergency response particularly challenging.

Hydria challenges this discrepancy by introducing autonomous temporary water storage devices in remote Alpine locations. The strategically placed structures collect water at critical locations to address the growing imbalance between supply and demand, serving as crucial water-gathering points for firefighting helicopter operations in this mountainous terrain. The temporary, lightweight octagonal metal structures, lined with a thin fabric roof membrane, can be delivered by helicopter to remote alpine "black spots" in the firefighting network. As the cable-supported fabric canopies fill with rainwater during the peak late summer and autumn periods and are emptied during wildfire events in the spring, the space below adapts and reacts to the rhythm of natural filling and human-activated emptying.

The structures not only harvest rainwater but also provide shelter in the process. The rigidity and shape of the roof structures change constantly throughout the year – a shifting skin that both holds and houses. Without a definitive form, the structure functions as both a roof and a container that, when holding water, transforms into an artificial bathing space – creating temporary public zones in the high Alps where recreation and utility converge. This flexible infrastructure nurtures exchange and fosters a sense of community.





Forest fire in Ticino, 2022. Inaccessible areas in the Alps require potential solutions. These function as networks that together constitute mobile fire management practices

**Heavy Rains
(Slow Rivers)**

The canton of Ticino is renowned for its microclimate, Mediterranean weather and dramatic rainfall patterns. These episodes occur briefly yet intensely during the late summer and autumn months, when the mountains release torrents of rainwater, rejuvenating the valleys below. While prolonged periods of continuous rainfall extend into early winter, the erratic and sudden summer downpours pose the greatest risk.

For millennia, rivers from the Alps have descended into the valley, feeding the southern lakes. However dire predictions of intensified rainfall patterns are raising concerns over heightened flood risks bringing Ticino's robust water infrastructure to a critical tipping point. This is due to rising atmospheric temperatures and the escalating levels of moisture evaporating from nearby water bodies – a spectacle that culminates in extreme rainfall. In the summer of 2024, massive amounts of rain wreaked havoc across the valley,



Floodplains and rivers in Ticino, 1951, 1965. Modern water correction principles are unable to contain water once a threshold has been reached. The potential to counteract excessive rains exists in hybrid adaptable systems

with some areas receiving up to 250 liters of rain per square meter. This deluge inundated basements and put significant strain on the Ticino River canal system, threatening crops, industries and people.

The Magadino Plain, the focus of the *Moor is More* project by Senta Fahrlander and Michael Utiger, has historically served as a natural regulator of water fluctuations in Lake Maggiore. However, resource scarcity, food shortages and health concerns prompted the canalization of the rivers and the complete drainage of the marshlands along their banks. Canalization efforts began at the end of the 19th century and expanded between the 1920s and well into the 1950s. Today, *Moor is More* seeks to counteract the rapid flow of water by offering an alternative solution that utilizes a localized water distribution infrastructure.

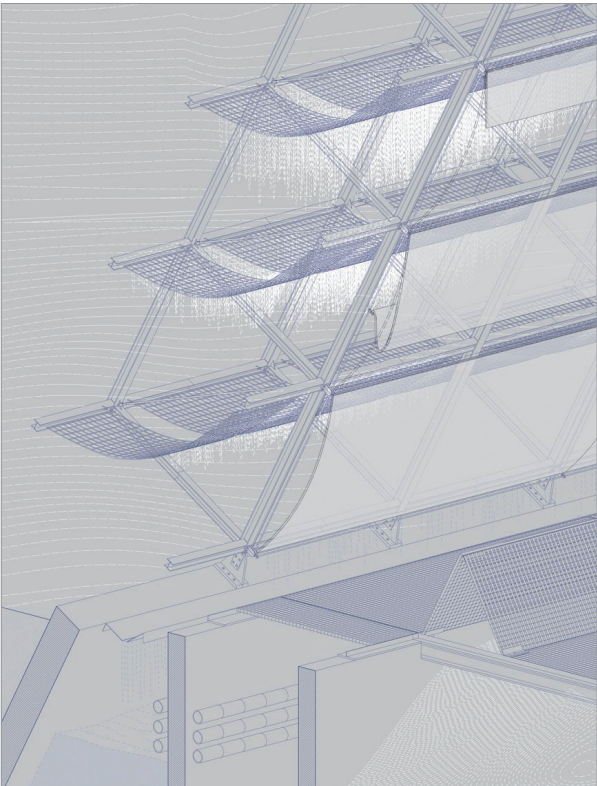
Moor is More controls the infiltration of water into the ground by directing it into retention infrastructure, thereby enriching local water bodies and facilitating distribution. Along the north-south trajec-

HYDRIA

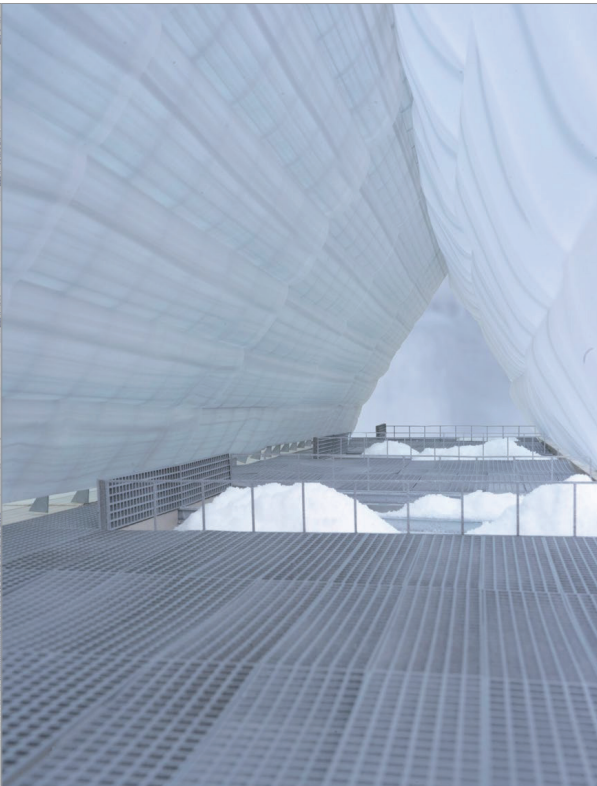
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MOOR IS MORE

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La Cristallina



Marco Weber / Philip Einsbas / Silvan Muff

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Violeta Burckhardt, Matthew Phillips

The Anatomy of a Dwelling. Illustration by François Dallegret to Reyner Banham's essay "A Home Is Not a House," 1965. The house as an organism that supports living by integrating modern technical services and functions

Drought
(Hydrant)


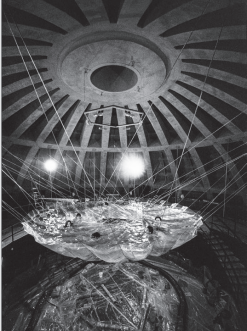
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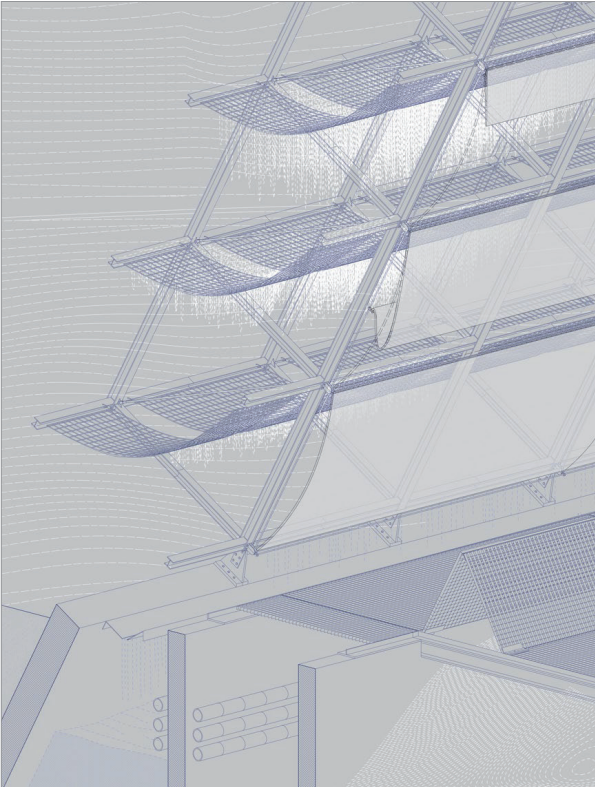
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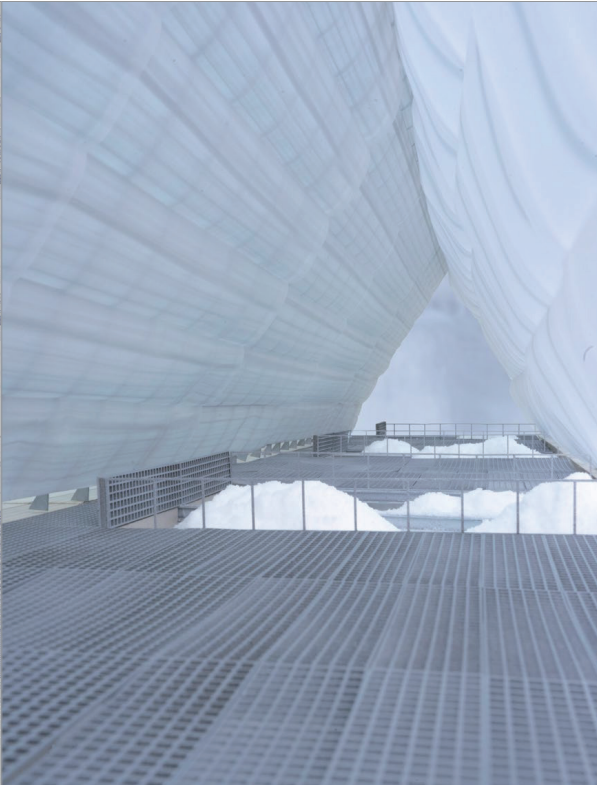
Floodplain and levees in Ticino, 1951, 1965. Modern water correction principles are unable to contain water once a threshold has been reached. The potential to counteract excessive rains exists in hybrid adaptable systems

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La Cristallina

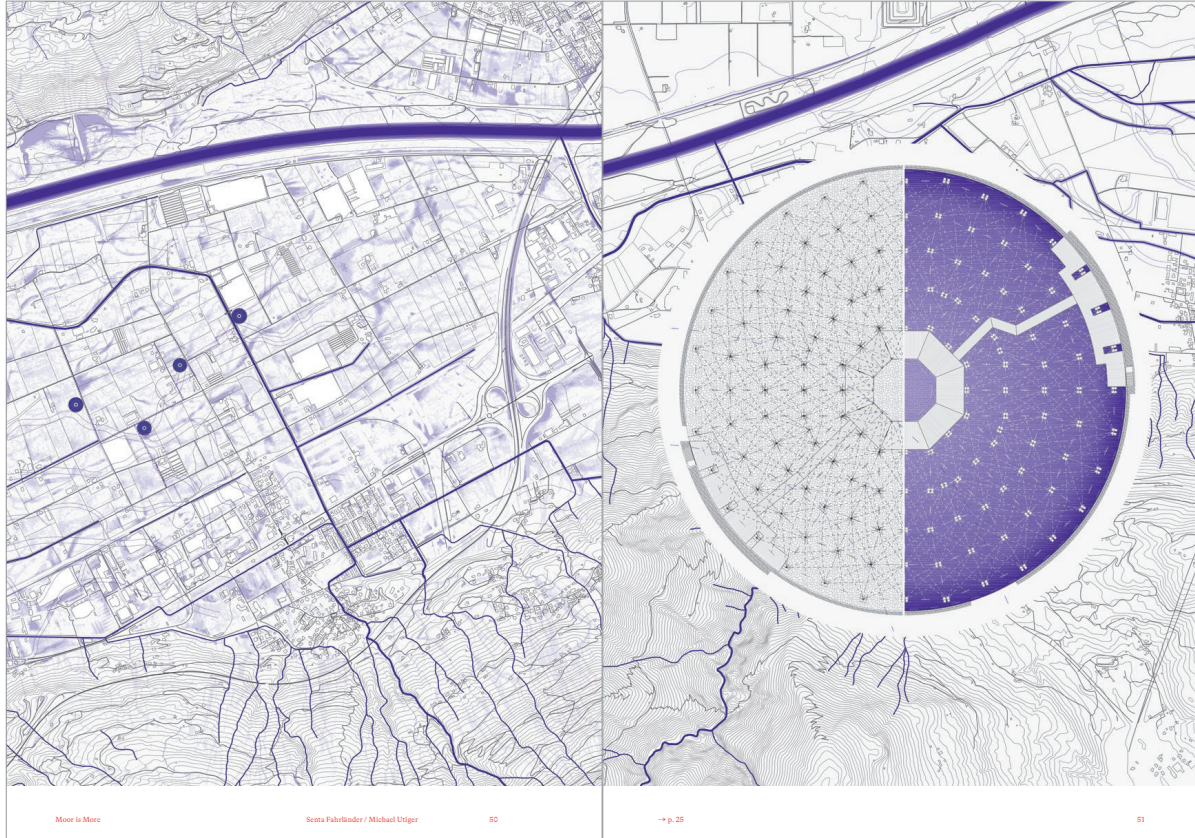


Marco Weibel / Philip Einsbas / Silvan Muff

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Moor to Meer

Santa Fehrländer / Michael Utiger

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Over the past 150 years, Ticino has been shaped by profound economic and social transformations. Repeated periods of growth and shrinkage have alternated in varying cycles.

Until the beginning of the 20th century, life in the mountain valleys of Ticino was dominated by laborious and sometimes scattered small-scale agriculture, livestock farming and forestry on the steep slopes with dense forests and high-altitude summer pastures. The drastic industrialization that took place in other parts of Europe in the 19th century was largely absent. Due to the difficult economic conditions, many people from Ticino left home in search of work and better wages in other parts of Switzerland or abroad. It was not until the 20th century, with the use of modern machinery and new economic opportunities, that the way agricultural land was cultivated began to change. With the spread of industrial production, subsistence farms were no longer operated by subsequent generations. Agricultural buildings were either converted or left to deteriorate.

In the first half of the 20th century, the flourishing global trade in goods, the incipient division of labor and the creation of national infrastructure to meet the needs of a modern work and leisure society led to rapid economic and spatial change, with the population concentrating in the urban centers, on the lakes of Ticino and in the main valleys between Airola and Chiasso. Private and public construction began, leaving visible traces in its wake. National and regional roads, railroads and large infrastructure projects for energy production were built. Beginning in the 1950s, numerous dams, the A2 Autobahn in Ticino and the Gotthard Road Tunnel were erected. The growing demand for housing led to extensive new construction across the urban agglomerations of Bellinzona, Locarno, Lugano, and Mendrisio-Chiasso, particularly in the form of single-family houses.

With the economic and demographic changes of the network economy, the demand for modern and comfortable residential and vacation properties increased from the 1960s onward. The local construction and real estate industry developed into a speculative sector. The building boom was supported by the high availability of building land and industrialized construction techniques, but also

BETWEEN GROWTH AND SHRINKAGE – THE DISCOVERY OF CIRCULARITY

by new financing options. More was built than was needed. Despite stagnating or shrinking populations in many places, speculation in Ticino's municipalities continues to this day. In the last decade, between 400 and 600 new apartment buildings were built each year. However, even the large municipalities in the main valleys have grown only slightly in recent years and a 5.1 percent decline in the permanent resident population is projected for Ticino as a whole by 2050.

These processes of change have slowed in recent decades. The financial sector has shrunk massively due to changes in international regulations, the tourism sector is stagnating, and the aging of society coupled with the departure of the younger population poses new challenges for the region. A growing proportion of the working population commutes daily between work and home. A third of jobs now go to cross-border commuters from Italy.

This particular situation, with its recurring cycles of upswing, boom, downturn and crisis, predestines Ticino for the study and development of circularity. The projects described below offer exemplary responses to fluctuating population figures, changeable and adaptable forms of housing and a cultural heritage threatened by oblivion. Here, circular strategies for materials and construction are applied in different ways, anticipating future transformation processes and their side effects. The starting point is the heterogeneous building stock from different centuries.

Cultural Heritage and Circularity

Ticino's agrarian past is still visible in numerous abandoned agricultural estates, but many surviving examples of architectural heritage are in danger of falling into disrepair and oblivion. The project *Future Inheritance* by Pauline Sauter and Elischa Bischof explores the question of

how circular systems can contribute to restoring abandoned agricultural properties as material cultural heritage and to communicating their historical significance to the general public. For the 15th-century Masseria di Vigino in the Mendrisiotto region—a heritage-listed building at imminent risk of collapse—this case study proposes a phased restoration concept aimed at raising public awareness.

Metal scaffolding supports the dilapidated exterior walls, allowing the entire estate complex to be wrapped in an architectural textile. This outer skin makes the metamorphosis of the cultural asset visible from afar. In this way, a temporary spatial layer is created around the existing building, an on-site infrastructure that protects the numerous steps of the comprehensive restoration and at the same time serves as a place for commu-

nication and educational outreach. In the first phase of the restoration, sleeping compartments made of felt are suspended inside several scaffolding towers to serve as rooms of a hostel. Since the construction site is also 'inhabited', anyone who is interested can watch and learn how the ruins are gradually transformed into a living historical monument for the future. Gradually, under the watchful eye of the public, the load-bearing structure is reinforced, the roof is replaced, wood-beam floors are added, windows are installed, and the building services are connected—until the first rooms are opened as a workshop and café. At the beginning, the hostel is housed in the scaffolding, but by the end of the process, it is located in the refurbished rooms of the *Masseria*. Not only the restoration itself, but the entire renewal process constitutes a form of living preservation—one that transmits knowledge about craftsmanship and construction practices.

New Infrastructures and Demographic Change

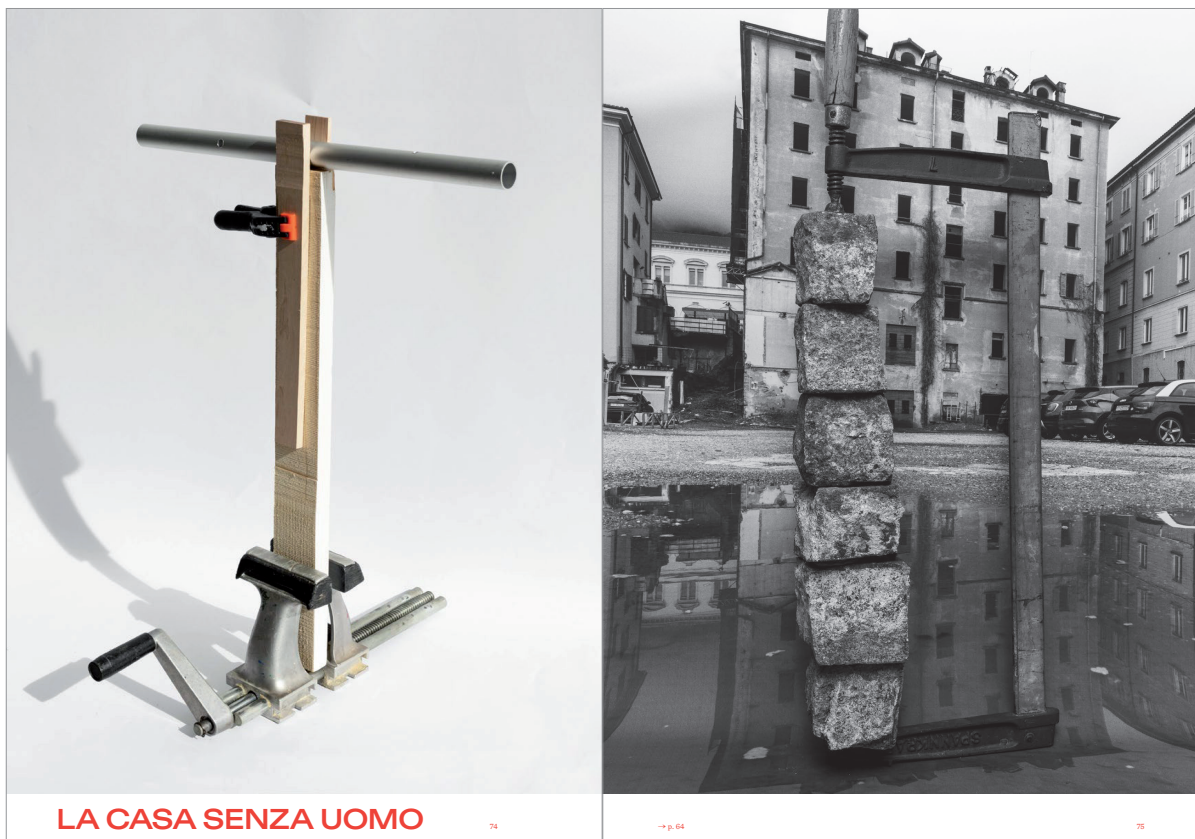
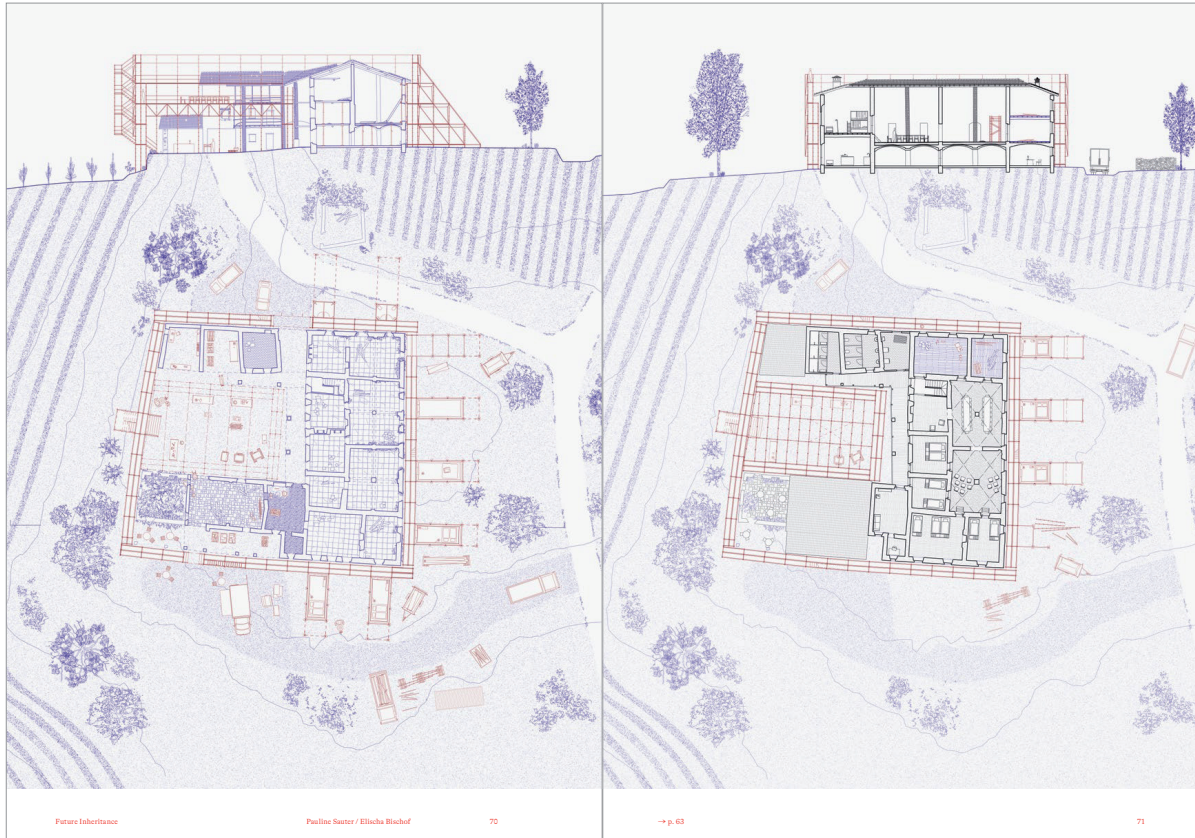
The completion of the Gotthard Base Tunnel in 2016 and the Ceneri Base Tunnel in 2020 provided another boost to development. Train travel time between Zurich and Bellinzona has been reduced to less than 100 minutes. The canton's public transportation system has been further expanded and optimized. Bellinzona's importance as the gateway to Ticino and as the hub of the efficient *Città Ticino* transport axis has been strengthened by these transportation projects. For decades, economic development in the Sopra- and Sottoceneri regions has been concentrated along the dominant Bellinzona-Lugano transport axis. Between 2010 and 2023, the population of Bellinzona increased by 11.1 percent as a result of new high-speed connections from northern Switzerland and within the canton. In addition, 10,000 people commute to and from work in Bellinzona every day. The percentage of smaller households and the demand for apartments for one- or two-person households increased significantly during this phase.

In light of these economic and demographic developments, Céline Ryffel's and Joël Liechti's project *La casa senza nome* asks what kind of housing might be in demand in a dynamic place like Bellinzona. The scaffolded historic building *Gioconda* next to the train station, whose unoccupied state and location offer great potential



Alley in the old center of Cortigios, late 1920s. Simple everyday life of farming families in the mountain village of Cortigios, with its narrow streets and traditional stone houses, in Valle Verzasca at the beginning of the 20th century

FUTURE INHERITANCE



**Quarries in Switzerland:
Stone in Abundance**

Until the 19th century, natural stone in Switzerland was mainly quarried locally, often by hand, using simple, laborious methods, close to where it was needed. Only a few special and valuable types of stone, such as Arzo marble, were transported over long distances. Benefiting from the economic boom and the aforementioned expansion of the railway network, which facilitated the trade in natural stone, the stone industry in Switzerland experienced a significant upswing from 1850 onward. By the First World War, there were approximately 1,000 active quarries in Switzerland. At the beginning of the 20th century, the Swiss stone industry suffered a massive slump. The decline in construction activity, competition from cheaper materials, such as concrete and steel, and the easier import of foreign stone led to the closure of numerous quarries. Today, only 77 active sites remain in Switzerland. About a third of them are located in Ticino, where large quantities of metamorphic rock, especially gneiss, are extracted.

Extraction techniques vary depending on the rock and its intended use. When large quantities of hard rock are to be extracted at one time, the traditional method of blasting is employed. The by-product is a high proportion of material of inferior quality or size that is not ordinarily used. Cutting with a diamond wire saw is more precise and therefore saves material. The process involves wrapping a diamond-studded wire around the rock and rotating it continuously to cut the rock, applying water as a coolant. The technique of drilling and splitting involves drilling holes into the rock and then inserting splitting wedges into the holes. Manual, hydraulic or pneumatic pressure is used to split the blocks of stone along a natural fracture line.

An example of the latter extraction method can be seen at Cava Boschetto in Cevio. The Maggia gneiss quarried there is characterized by its good fissility, so the slabs are often used with a raw split finish. Since the quarry is expected to close in the next ten years due to the expiration of its mining concession, intensive quarrying is currently taking place. Masses of raw stone blocks are being extracted from the mountain and stored on site for use when the quarry ceases operations.

The project *La permanenza come contenitore del cambiamento* (Permanence as a container for change) by Renia Bode and Michel Credier proposes to incorporate the rapidly accumulating mass of quarried material into an architectural project, thus providing a means for its temporary storage.

The building's expression, which is reminiscent of baroque stage curtains, makes use of the raw split stone blocks and exploits the structure as a material repository. The production and construction processes are coordinated. The concept calls for the stone blocks to be connected by rods or cables to maximize their compressive strength through posttensioning. The structure of natural stone elements forms an exoskeleton that enables different uses and can be flexibly adapted to changes. This is intended to provide a sustainable solution for dealing with the remaining rock and creates the image of a stone curtain for an ever-changing material repository that guarantees adaptability not only in its interior, but also in its basic structure, or even its eventual dismantling.

The construction and physical manifestation of the building tell the story of the genesis of the stone as well as the political and economic conditions of its extraction and processing at its place of origin. The concept of stockpiling finds dual expression in the building: the large number of stone blocks that make up the facade tells of the material flow and its provenance, while the evocative detail of stacking manifests the structural load-bearing condition.

**Constructional Method:
Tectonic Opulence**

The use of natural stone as a load-bearing construction material requires specific consideration not only of the material flow, but also the stone's material properties. Its formation and the associated stratification in the mountain opens up a specific range of possibilities for its use in the building: It determines the shapes and sizes that can be quarried, the possibilities for joining (friction, insertion, stacking, wedging) and the bedding plane orientation of the various stones and rock types. The tectonics of the mountain are directly translated into the structure of the building: The mountain is the basis for the size and workability of the rough blocks; their original position in the mountain determines their compressive strength in three-dimensional space.

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**LA PERMANENZA COME
CONTENITORE DEL
CAMBIAMENTO**

LANGSAMER BAUSTELLE

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