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Can Vernacular Architecture Adapt Without Losing Its Identity?

Climate Change, Heritage Regulation, and Habitability in the Walser Architecture of Pedemonte, Alagna Valsesia





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Can Vernacular Architecture Adapt to Climate Change Without Losing Its Identity?

A Temporal Case Study of Walser Architecture in Pedemonte, Alagna Valsesia

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I count myself incredibly lucky that, while casually browsing maps one day, I found the beautiful Valsesia Valley. A quick dive into the area introduced me to Walser architecture, and it completely blew me away. I've always been drawn to vernacular mountain design and the idea of building in harmony with what's already there. But the Walsers took it to a level I'd never imagined, showing how an entire community could operate seamlessly, almost like a living, breathing machine.

Crossing paths with **Antonio De Rossi** and **Federica Serra** felt like pure luck again. Realising they'd been working in these exact themes for years was deeply inspiring, and it naturally gave birth to this thesis. This study truly redefined my architectural lens. It wasn't a walk in the park; there were plenty of moments when I felt overwhelmed trying to juggle a million things at once. Yet looking back, all I see is how much I managed to pull off.

It is strange to say, but here is the end of this very long journey.

I definitely didn't fight this battle alone.

***Dad,** even when everyone else was saying no, you had my back and believed in my dreams. You're the biggest reason I'm standing here today. Because of you, I'm not afraid to try, and I'm not afraid to fail.*
Thank you.

***Mom,** even with the miles between us, you've been my absolute everything.*
Thank you for spending hours on the other end of the phone just listening to me.

*And to **my little sister,** knowing you'll always be there no matter what, and that you'll always be my best friend, is honestly one of the greatest gifts I have in life.*

I love you with all my heart.
Thank you for everything.

My dear playmate, *before I met you, something was always missing, something was always hard in this city. Since you came into my life, everything has become easier. If I can fight so bravely and strongly today, one of the biggest reasons is that you are always standing right beside me.*

A very special thank you goes to ***my cat, Fred.*** *You have been my greatest joy and my deepest source of healing. Thank you for staying awake with me until the early hours of the morning during this entire thesis process.*

To ***my dear friends,*** *both those standing next to me here and those supporting me from afar, your presence and love truly make the world a more beautiful, warmer, and safer place. Thank you all so much.*

I want to save my final thank you ***for myself.*** *Because a crucial yet unseen part of the story always lies within us.*

Twenty years ago, there was a little girl who rolled up pieces of paper pretending to be an architect, who dreamed of travelling the vast world but felt stuck, not knowing how to move forward. Today, I am so incredibly proud of her for being here, for winning all her battles, for turning zero into a hundred no matter what, for creating something out of nothing, and for her immense strength and courage.

I hope to keep making that little girl proud for the rest of my life.

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Architecture is the very mirror of life. You only have to cast your eyes on buildings to feel the presence of the past, the spirit of a place; they are the reflection of society.

— I.M. Pei



Abstract

About seven hundred years ago, the Walser people established settlements in the Alps. They constructed distinctive vernacular dwellings using timber and stone. Every architectural element served a highly specific function to ensure survival during prolonged, harsh winters. Today, however, a critical dilemma has emerged. The Alps are undergoing rapid climatic shifts, and traditional design paradigms are no longer effective. Currently, these changing environmental conditions are actively degrading the structures. Simultaneously, rigid conservation frameworks are enforced to protect heritage buildings. Consequently, these preservation rules restrict owners from implementing the adaptations necessary to protect their properties.

This thesis examines whether Walser architecture can adapt to this shifting climate without losing its defining cultural identity. It simultaneously questions whether current preservation regimes help or hinder this process. To investigate this, the settlement of Pedemonte serves as a detailed case study. Contemporary building data from 2026 was compared to historical inventory records from 1968. Each architectural component was evaluated across three metrics: its physical vulnerability to climate variability, its cultural significance, and the constraints imposed by existing heritage regulations. The analysis found out the following primary findings. First, the conflict between preserving cultural heritage and physical adaptation is rarely definitive. Often, the elements most vulnerable to climatic degradation hold less cultural significance. Consequently, owners can legally make adaptive interventions within the existing regulatory framework. Second, the traditional open timber galleries represent the most important point of conflict. These specific structures deteriorate rapidly under the altered climate conditions. Because they are central to Walser cultural identity, they are subject to strict legal protection. In this specific scenario, conservation protocols designed for a stable climate paradoxically harm the heritage they intend to protect. Even where a specific climate threat is easing rather than worsening, as with the freeze-thaw cycling acting on the stone base, the affected element can still be among the most heavily altered in the settlement, which shows that use, not exposure, drives the change.

Finally, across this sample, climate change does not explain why otherwise identical buildings were treated so differently. Need does: what an owner requires from a building, not the climate acting on it, drives the difference between adaptation and loss. This does not make climate inert. It raises the cost and urgency of maintaining historic fabric in its original state. But the divergence in outcome traces back to decisions, not to weather.

Introduction

The vernacular buildings of the Alps were built to meet a particular climate, and that climate is now changing faster than the global average. This poses a problem that is at once physical and cultural. These buildings are valued as heritage, because they carry the identity and craft of the communities that made them, but their form is also a tested answer to environmental conditions that no longer hold, so the warming climate threatens both their fabric and the logic of their design. The difficulty is that the two values cannot be separated. The features that make a vernacular building culturally distinctive are often the same features that did its environmental work, so a change that protects the fabric can erase the identity, and a rule or an intervention meant to bring the building into modern use can destroy the very thing that made it worth keeping. This thesis examines that difficulty through a single, closely studied case.

The case study is the hamlet of Pedemonte, in Alagna Valsesia, at the head of the Sesia valley below Monte Rosa. Pedemonte preserves a dense group of Walser houses, the timber-and-stone dwellings of a German-speaking people who settled the high valleys around Monte Rosa from the twelfth and thirteenth centuries and developed a building type of unusual coherence and refinement. The Walser house gathers dwelling, stable and barn under one roof and wraps a timber core in an open gallery, and every part of it, as the following chapters show, answers a specific environmental demand. It is therefore an ideal subject for the question this thesis asks, because it is both a recognised heritage type and a clear example of vernacular form as climate-responsive design.

The research question is: Can the vernacular buildings of Pedemonte adapt to a changing climate without losing the identity that makes them worth preserving? The question is deliberately framed to expect a differentiated answer rather than a simple yes or no, because the central claim of this thesis is that the threat does not fall evenly across the building. Some elements adapt while keeping their character, others are at risk, and one element in particular concentrates the difficulty. The open gallery, the Schopf or loggiato, is at once the most identity-defining feature of the house and the element whose original working purpose has most completely disappeared, since no gallery in Pedemonte still dries a crop. That combination, a form everyone can read and a function nobody needs, is what makes the gallery the hinge of the whole inquiry. The question, properly answered, is therefore a set of element-by-element answers that together show where adaptation is possible and where it is not.

The answer can be stated at the outset, because it is the thesis's principal finding and everything that follows is built to test it. Climate change is rarely what damages a Walser element. What alters it, or removes it, is the demand to bring the building up to modern standards of comfort, safety and energy performance, a demand that exists independently of the climate and is enforced by building codes and habitability rules rather than by weather. The role of climate change is to raise the cost of leaving a feature unchanged, and it does so at the same moment that heritage law, built on a conservation logic more suited to a visited monument than to an inhabited house, insists that the feature stay exactly as it is. The conflict this thesis studies is therefore not a building against a changing climate. It is a building held between two bodies of rule that both carry legal weight and that ask for opposite things, one designed to preserve a fixed historic fabric and one designed to make a house fit to live in. That conflict predates the warming of the Alps. Climate change is what forces it into the open.

Understanding why requires a particular reading of what the climate is doing. The decisive change is not the rise in the average temperature but the loss of predictability. A traditional building can absorb a slow shift in mean conditions, because its materials and its maintenance cycle adjust along with it. What it absorbs poorly is a widening range of conditions arriving unevenly, and Chapter 1 shows that four of the five mechanisms acting on these buildings are driven by variability rather than by the average. The consequence reaches beyond the fabric, because a vernacular building is not only a form but a maintenance cycle, and that cycle was scheduled by expectation. When the pattern dissolves, the tradition that kept the building standing loses its calibration along with the building. This pressure is expected to deepen. Recent work across nearly three hundred Alpine weather stations projects that two degrees of regional warming could double the frequency of extreme short-duration summer downpours, with the intensification strongest at higher elevations. What this thesis records in Pedemonte is therefore an early stage of a longer trajectory, and the question it asks is prospective as much as retrospective.

The argument proceeds in four stages. Chapter 1 establishes the conceptual apparatus: what a vernacular building is, why the mountains produce a particularly climate-tuned architecture, and why monuments and diffused vernacular heritage, though protected by the same laws, face entirely different demands. It closes by showing how a changing, increasingly unpredictable climate turns this latent asymmetry into an active conflict. Chapter 2 turns to the Walser house itself, tracing its architecture element by element and, for each one, weighing its original function against its climate exposure and its collision with modern living standards. Chapter 3 tests this reading against the evidence of Pedemonte, an original survey of eight buildings comparing their documented condition in 1969 with their state in 2026. Chapter 4 draws the argument together, returning to the question posed here and asking what kind of adaptation, if any, allows a Walser house to change without ceasing to be a Walser house.

I went to Pedemonte, and I understood vernacular architecture for the first time. These houses are not picturesque objects placed in a landscape. They are answers, worked out slowly and tested over centuries, to the question of how to live in a difficult place. In their timber and stone I found a story, an engineering and a way of being a community, and all three at once. That is why I believe these buildings are worth protecting.


adaptation
environment
architecture

C.1

Concepts and framework



1.1 Mountain Built Environment

Buildings are not merely objects. They are part of a larger system that includes the ground on which they stand, the surrounding climate, the materials from which they are made, the labor that built them, and the community that uses them.

For built environment scientists, this system is defined as a set of layers, each layer interwoven and shaped by its surroundings, extending from the room, the building, the dwelling place, and the wider landscape (McClure & Bartuska, 2011). Therefore, a building cannot be understood in isolation. To understand it, one must understand the visible consequences of the forces acting upon it. Rapoport (1969/2011) argues that built forms are not shaped solely by material concerns, rather, they evolve through the entire social and environmental context in which people construct them; thus, houses reflect the priorities and habits of the people who built them. This systemic view is so important in the mountains compared to any other place due to the nature of the mountainous environment, which imposes severe restrictions on construction. The steep nature of the land limits the placement of buildings, while the short period of warm weather restricts the time of construction activities. Level ground is scarce, transportation is hard, and materials need to be sourced locally. (De Rossi, 2024). Each of these constraints removes options, so the builder is pushed toward a narrow set of workable solutions. As a result, the mountain building carries the marks of its environment with unusual clarity, and it can be read as a record of the conditions that produced it (Rapoport, 1969/2011).

It is important to note that the Alps are not a wild landscape with buildings randomly lined up. This environment is the result of centuries of construction and work. Forests have been cleared, slopes terraced, water channels dug, and settlements deliberately established in specific locations. Therefore, the built environment of the Alps is the result of a long human project, and its buildings are documents of that project, rather than interventions in a natural landscape. (De Rossi, 2024). The individual houses or cottages that appear within this artificial landscape function as structural elements that simultaneously carry both a practical function and a cultural meaning. (Bernard, 2025).

This thesis takes that individual building as its unit of analysis. It reads a single traditional building as evidence of its environment, on the understanding that the building's form is an answer to the conditions around it. The next section develops this idea directly, because if the building is an answer to its environment, then a change in that environment must put the answer in question.



[Fig 1.1] Breuil-Cervinia, Photo by the author.

1.2 Vernacular architecture as climate-responsive design

The buildings that fill the mountain landscape are vernacular buildings. These buildings were designed and built not by trained architects, but by their users and local builders. They rely on local materials, knowledge passed down through practice, and a process that has slowly evolved over many generations. Because each generation preserves what works and removes what doesn't, the vernacular architectural structure is not an attempt, but a tried and refined solution. Therefore, the vernacular architectural form deserves to be considered not as a lack of design, but as a form of knowledge (Rubio-Bellido et al., 2015).

The main characteristic of this information is its response to the climate. A traditional building must make its users comfortable and keep them safe without needing the mechanical heating, cooling, or drying systems found in modern buildings. And it must do this through its form. The orientation, the mass of the walls, the placement and size of the openings, the way air moves, and the handling of precipitation are all adjusted to the local climate (Rapoport, 1969/2011). Each of these features is an answer to an environmental question, and together they make the building a climate-sensitive tool (Rubio-Bellido et al., 2015). The same logic explains why traditional buildings differ so much from one valley to another, because each is adapted to its own conditions. This point forms the basis of the present thesis. If vernacular architecture is a response to the climate, this response is only valid as long as the climate exists. When the climate changes, some features retain their function while others become incompatible with the environment in which they were built. A feature that once fulfilled a necessary function may become a feature subject to deterioration because it no longer serves its intended purpose. Therefore, the question is not whether these buildings will be affected, but which features will retain their purpose and which will lose it.

There is another complexity that makes the question more difficult. These buildings are valuable for two different reasons simultaneously, and these two cannot be clearly separated. They are valuable both as cultural heritage, because they carry the identity, history, and craftsmanship of the community that built them, and as embodied environmental intelligence, because their forms store climate knowledge tested over centuries (Comoli Mandracci, 2008). A property can be both culturally significant and environmentally degraded at the same time. This is precisely the case that the thesis will examine, and therefore the preservation of these buildings cannot be treated as merely a conservation issue or merely a performance issue (Miller & Wright, 2023). It addresses this same tension on a larger scale and considers heritage as something at risk under the climate crisis.



[Fig 1.2] A Walser structure in the Gressoney Valley, Photo by the author.

1.3 Monuments and diffused vernacular heritage

Before exploring the impact of climate change on historic structures, it is necessary to define the two types of heritage examined in this research. While they do not differ in location, these two categories of built heritage are completely different in terms of function and usage. This distinction create different preservation obligations when dealing with a changing climate.

Monuments

In the context of this study, a monument refers to a building that is open to visitors but not used as a residence. The Colosseum in Rome, Palazzo Madama in Turin, and the Walser Museum in Alagna can all be classified as monuments under this definition. They can be ruins, functioning museums, or sites for ceremonies, but they have one thing in common, they are places where people visit, not live. A monument is open in the morning and closed in the evening. People do not spend nights in the Colosseum, nor do people cook in Palazzo Madama. Walser Museum at Alagna has preserved a house of 1628 Walser in its original condition, but people do not live in it.

This fundamentally changes the demands placed on the building by conservation practices. A monument does not need to meet modern comfort standards simply because nobody needs to be comfortable living inside it. Modern legal requirements for natural light, ceiling height, insulation, airtightness, and heating efficiency applies only to habitable buildings, not to monuments. The original small windows can stay small. The thick, uninsulated walls can remain uninsulated. A cold and damp basement can stay cold and damp. The structure can be perfectly conserved in its original state because it does not have to house a modern family.

Current regulations support this perspective. *The conservation of monuments is a key part of Italy's Codice dei beni culturali e del paesaggio (D.Lgs. 42/2004), which focuses on preserving the actual material integrity of the building in its historical state (Ministero della Cultura, 2004). The principles behind this code are based on the 1964 Venice Charter (ICOMOS, 1964). They assume that a building's true value lies in its historical authenticity, and that any change is equal to destruction. This principle fit monuments perfectly.*

This fit is not accidental. *The Venice Charter of 1964 was written with monuments specifically in mind, and ICOMOS itself later recognised that its principles did not extend comfortably to vernacular building. The 1999 Charter on the Built Vernacular Heritage states this directly, noting that vernacular structures face distinct problems of obsolescence and continued use, and that it is necessary, therefore, in addition to the Venice Charter, to establish principles for the care and protection of our built vernacular heritage (ICOMOS, 1999). The 1999 Charter defines the vernacular not as a fixed historical object but as a continuing process including necessary changes and continuous adaptation as a response to social and environmental constraints (ICOMOS, 1999), a definition that assumes change rather than treating it as loss, which is the opposite of the Venice Charter's logic.*

A second doctrinal text sharpens this further. *The Nara Document on Authenticity (1994), while written in the context of the World Heritage Convention rather than for vernacular heritage specifically, breaks with the assumption that authenticity resides only in unchanged material fabric. It holds that authenticity may be assessed through several independent sources, including form and design, materials and substance, use and function, traditions and techniques (ICOMOS, 1994), and that no single source should be applied as a fixed universal criterion*. This matters directly for the argument developed in this thesis. If form and function are treated as separate grounds of authenticity rather than as one derived from the other, then a building can retain authenticity through its legible form even after its original function has ended, precisely the condition this thesis identifies in the Walser gallery, discussed at length in Chapter 2 and Chapter 4. The tension the thesis works through is therefore not an invention of the present analysis but a specific instance of a debate already active within conservation theory itself.

Diffused vernacular heritage

Diffused vernacular heritage consists of structures that actually serve as people's homes. For instance, a Walser house in Pedemonte where a family lives, a farmstead in Val d'Aosta occupied by its owners, or a permanently inhabited village house in Grosses Walsertal all belong to this category. Unlike monuments, these buildings are not meant for tourists; they are for actual habitations. They feature active kitchens where meals are prepared, functional bedrooms, working bathrooms, and modern heating systems for the winter.

This reality completely change what conservation requires from these structures. Modern families have a number of requirements for their everyday lives that necessitate a vernacular building to be able to comply with modern standards regarding comfort, heat insulation, safety, and services. The Italian residential regulation (for example DM 5 luglio 1975) provides for a certain ratio between windows and floor area, certain minimum ceiling heights in rooms, and minimum ventilation. Moreover, modern energy performance rules (D.Lgs. 192/2005) require very high minimum U-values. This can hardly be provided by the existing construction without considerable changes. Structural and fire safety codes also require complex calculations and interventions. All of these requirements must be met because a diffused vernacular building is a living home, which carries legal and practical obligations that a monument simply does not face.

The core problem is that the exact same legal framework used to preserve static monuments also applies to these inhabited buildings. The national Codice protects the Walser house in Pedemonte as cultural heritage, while the Piedmontese regional landscape plan (PPR) safeguard its characteristic exterior elements (Regione Piemonte, n.d.). However, unlike a monument, the vernacular building must also function as a modern house. Strict conservation laws, which are designed to freeze buildings in their original historical state, are being used to regulate homes that physically cannot remain unchanged if they are to accommodate a contemporary family. This inherent contradiction is the central tension explored throughout the rest of this thesis.

	(1) **Monuments**	(2) **Diffused vernacular heritage**
Examples	Colosseum, Palazzo Madama, Walser Museum of Alagna.	Private Walser houses in Pedemonte, village dwellings in the Grosses Walsertal.
Where the value lies	In the single, named building and its authentic fabric.	In the ensemble of buildings and the living culture they hold.
Legal protection	Codice dei beni culturali (D.Lgs. 42/2004), individually designated.	Codice (D.Lgs. 42/2004) plus Piano Paesaggistico Regionale (PPR), landscape-scale designation.
Modern habitability standards	Do not apply, no daily residents.	Apply fully, must meet modern housing, energy, and safety codes.
The conservation instinct	Preserve the fabric unchanged.	The fabric must keep working to serve modern occupants.
Response to climate change	Physical fabric may need protection, but function does not need to adapt.	Fabric and function must both adapt while identity is kept.

[Fig 1.3] Urban / monument heritage compared with mountain / vernacular heritage.

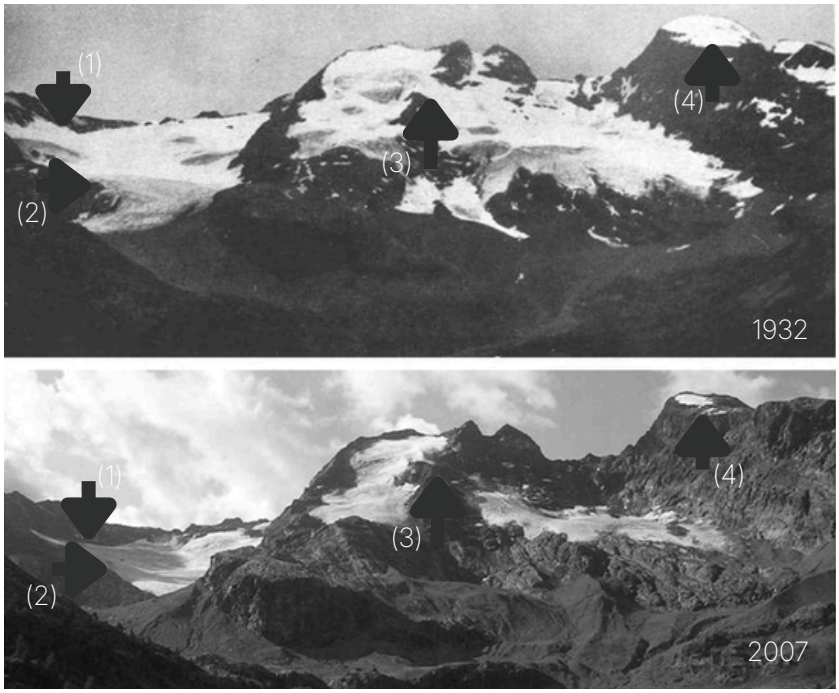


[Fig 1.4] Comparison of monument and vernacular heritage with images. (1) - Palazza Madama. a museum in Turin. (2) - A house in Pedemonte.

This thesis examines both categories of heritage. The study area, the hamlet of Pedemonte, contains both residential buildings and museums. For example, the Alagna Walser Museum functions as a monument. This museum is frequently visited and strictly protected by law. In contrast, the privately owned Walser houses in the surrounding area of Pedemonte represent a widespread local heritage. These structures are still used as residences. While they are protected due to their historical and cultural significance, they must also comply with modern building regulations to accommodate their users. The comparison presented in Chapter 3 clearly demonstrates how these two types of historic buildings have behaved very differently over the last two decades. The first type, the monuments, have preserved their historical identity almost perfectly because they have not faced the pressure to adapt to modern living standards. The second, however, has undergone extensive changes because its inhabitants had no other option but to protect themselves and survive. Therefore, the distinction established in this chapter is not only theoretical but also highly practical. In conclusion, it defines the fundamental difference between the primary reference building and the other structures examined.

1.4 Climate change in the Alps

Climate change is a global problem, but it does not affect the entire world equally. Evidence of this is shown by the fact that the Alpine region is warming faster than the global average. Europe has warmed twice as fast as the rest of the world in the last thirty years, making it the fastest warming continent (World Meteorological Organization [WMO], 2024). The central part of the continent, including the Alps, is warming by 0.3 to 0.5°C every decade (Copernicus Climate Change Service [C3S], 2026). This rapid warming stems from the interaction between geographical influences and the presence of feedback mechanisms. For example, decreasing snow and ice cover leads to less reflection of solar radiation and increased heat absorption (Beniston et al., 2018). Consequently, warming becomes a problem for a geographical region where the architecture of buildings is designed to adapt to cold and heavy snowfall. Regional data perfectly correlate with the trends observed in the case study. Over the past sixty years, daily maximum temperatures in Piedmont have increased by 2°C, with this rise accelerating over the last thirty-five years. Minimum temperatures have increased by approximately 1.5°C over the same period. Meanwhile, minimum temperatures have increased by 1.5°C. Along with this warming, the region has experienced greater weather variability, including more off-season events and extreme rainfall concentrated in very short periods (Piedmont Region, 2026).

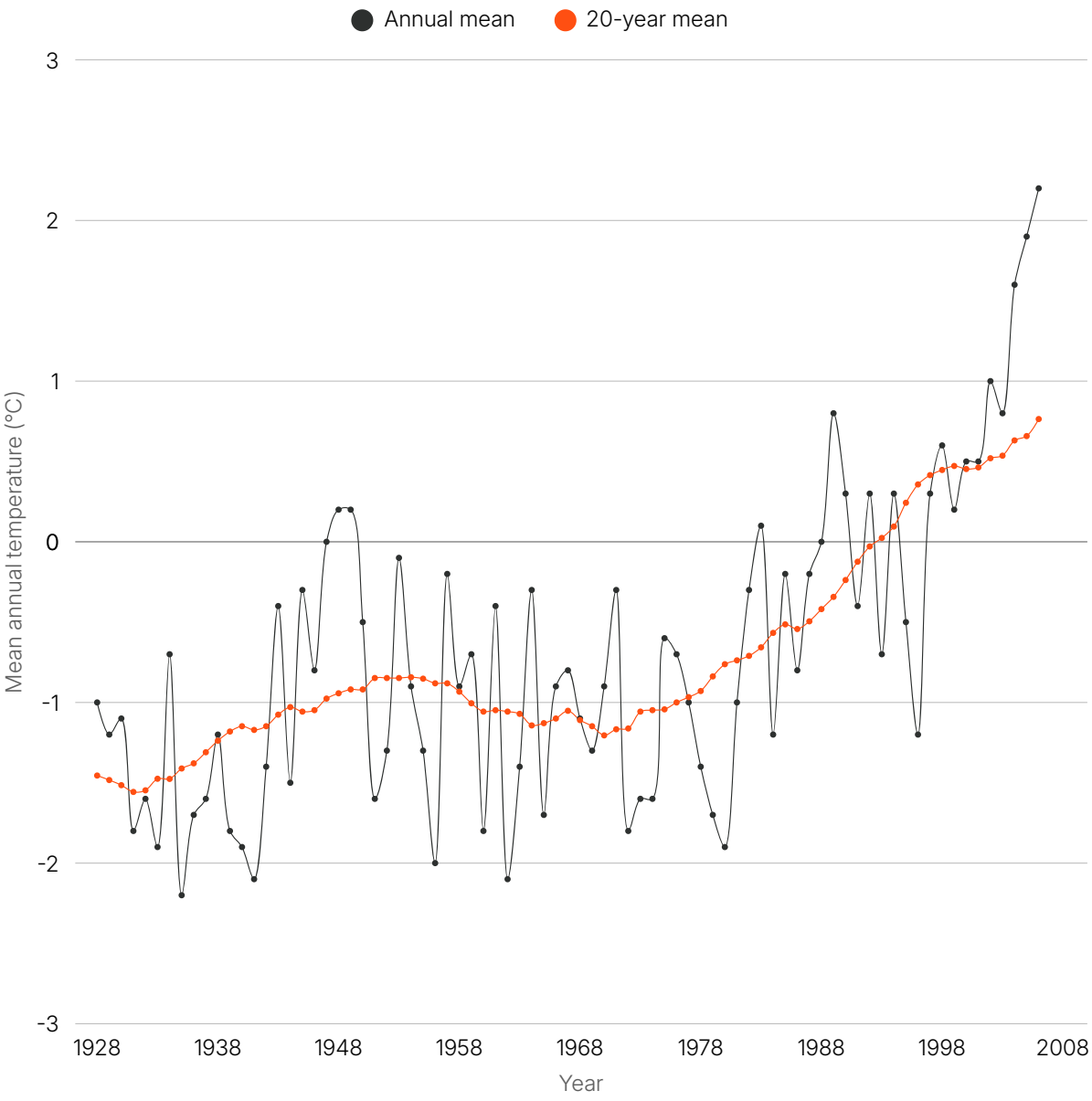


[Fig 1.5] An evidence for climate change in Italian Alps. Dosde Glacier, Italy. Comparison of 1932 and 2007. Source: Guglielmina Diolaiuti, University of Milan.

This means that the climate is not only warming but also becoming much less predictable, which is a critical issue, as buildings are much better able to withstand sustained stress than sudden and unexpected changes. This warming trend is confirmed by the closest long-term instrumental record to the case study. The Lago Gabiet meteorological station, in the Val Sesia a short distance from Alagna Valsesia and Pedemonte, has recorded annual mean temperature since 1928 as part of the HISTALP network (HISTALP, GeoSphere Austria). Though the station sits at 2,340 metres, well above Pedemonte's altitude, its long homogenised record shows the trend with clarity: mean annual temperature rose by approximately 2°C between 1928 and 2006, consistent with the wider Alpine pattern described above (Fig 1.4).

The most prominent sign of these changes in mountainous regions is the decrease in snowfall. Snow accumulation has decreased significantly in recent years across the European Alps. The most serious losses around the Alps have been documented at low and mid-altitudes (Matiu et al., 2021). The same situation is observed in Piedmont. The greatest decrease in fresh snowfall occurs between 1600 and 1700 meters (ARPA Piemonte, 2019; Regione Piemonte, 2026). This altitude range is particularly important for the analysis of this thesis because Pedemonte is located at approximately 1200 meters, close to the band where the greatest snow reduction occurs. Recent data from across Europe show how severe this problem has become. In March 2025, the snow-covered area across Europe was 31% below the 1991–2020 average, the third-lowest snow extent recorded since satellite monitoring began in 1983, and an area roughly equivalent to the combined territory of France, Italy, Germany, Switzerland and Austria (C3S, 2026). This report, covering conditions through 2025, was published in early 2026.

These regional changes are part of a larger transformation across the entire mountain system, including glacial retreat and permafrost thawing, which together demonstrate a departure from the conditions in which local communities were originally established (Beniston et al., 2018). The next section examines the direct physical impact of climate on architecture, rather than climate itself, because these environmental changes do not threaten buildings in isolation. They act on them through very specific types of physical stress and deterioration.



[Fig 1.6] Annual mean temperature at Lago Gabiet (2,340 m), the HISTALP station closest to Pedemonte and Alagna Valsesia, 1928–2006, with 20-year running mean. Source: HISTALP, GeoSphere Austria.

1.5 Effects of climate change on buildings

The trends described in the previous section do not damage a building directly. Warming air, shifting rainfall and a thinning snowpack are conditions rather than agents. They reach a wall through specific physical mechanisms, and each mechanism acts on a particular material in a particular position. Five of these are relevant to a house of timber and stone at altitude: thermal stress, moisture and permeability, freeze-thaw action, biological decay of timber, and changes in snow and wind loading. In practice they operate simultaneously and reinforce one another, since water prepares the fabric for frost and frost prepares it for fungal attack. Separating them is an analytical device, and it is the only way to establish which mechanism is responsible for which form of damage.

> Most detailed research on these mechanisms has been conducted in Britain or across Europe generally. For the mechanisms themselves this presents no difficulty, because ice expands against a pore wall in the same way wherever the wall stands. The extent to which a mechanism has shifted in one particular location is a separate question, and the physics does not carry that answer with it. This section therefore draws on Alpine and Italian evidence wherever it exists, and states the distance wherever it does not. Pedemonte has not been studied in this way, and Piedmont has no hazard mapping at the resolution now available for the Italian Alps further east.

1.5.1 Thermal stress

Thermal stress is the pressure that temperature change puts on a material. Every material expands when it gets warm and shrinks when it cools down. These rather slow movements continue in the background for years, eventually leading to loosening of the joints and the formation of fractures. A traditional building can adapt to the rhythm of expansion and contraction based on its local climate. However, when this rhythm changes, the movements become larger and less regular. This is a clear example of why variability is more important than average temperatures. Thermal stress is not caused simply by heat. Instead, it is caused by the difference between the highest and lowest temperatures a material experiences, and how often this change happens. If a material were kept at a permanently high temperature, it would suffer very little damage. But if it goes through a wider range of temperatures more frequently, it suffers a lot, even if the average temperature stays mostly the same.

At first glance, you might think that altitude offers some protection. Since Pedemonte is located at about 1200 meters, it is cooler on average than the valley below, which might suggest less severe temperature cycles. However, the evidence points in the opposite direction for two main reasons. The first reason relates to solar radiation rather than just air temperature. At higher altitudes, the atmosphere is thinner. Surfaces receive direct and strong sunlight during the day, but lose this heat very quickly at night. Therefore, even though temperatures are generally low, meaning the climate is cold, daily temperature variations continue to occur. Therefore, a lower average temperature often comes with a larger temperature range (Barry, 2008). The second reason involves how warming is spread across the mountain range, and this is highly specific to the altitude where Pedemonte is located.

A comprehensive review of Alpine climate projections shows that warming is actually amplified at higher elevations. In spring, this is largely driven by melting snow and the snow-albedo effect, while in summer, the warming is stronger at lower elevations (Gobiet et al., 2014). This same study predicts a sharp decrease in snow cover below 1500 to 2000 meters. Pedemonte sits exactly inside this vulnerable zone. As a result, the village does not benefit from its altitude. Instead, it is situated exactly where the snow-albedo effect is most active. It is high enough to lose the protective buffer of snow, but low enough to suffer from the intense summer warming as well.

There is one more consequence that affects the inside of the building rather than its outer structure, which connects directly to the arguments in Chapter 2. Research on retrofitted historic buildings in the Alpine region have found that adding modern insulation and airtightness to buildings that were never designed for them can actually increase the risk of overheating in the summer (Hao et al., 2022). A warming climate makes this risk even worse. Therefore, an intervention designed for make a house warmer in the winter can make it much less comfortable during the summer. Upgrading a traditional Walser house is not just a simple improvement in energy efficiency; it is a compromise between seasons. Ultimately, this compromise is made by the owner, not the climate itself.

Pedemonte sits inside the affected band follows from its altitude and from the Piedmontese snow record given in Section 1.4. No measurement of surface temperature cycling on a Pedemonte building exists, so the claim about the gallery below is reasoned from its exposure rather than recorded.

In the Walser house, the elements most exposed to thermal stress are the gallery and the exposed timber frame that carries it. The stone base is buffered by its own mass and by the ground it sits against, and the inhabited timber body is warmed from within for part of the year. The gallery is neither. It is unheated, open on its outward sides, and exposed to sun and to the night sky on both faces of every member, so its timbers take the full daily swing on all surfaces at once. Its components are also slender, with a high surface area relative to their volume, so they heat and cool faster than the heavy log walls behind them and work their joints harder as they do so.

1.5.2 Moisture and permeability

Moisture is undoubtedly the most destructive element for a traditional building. In fact, water triggers almost every single decay process, ranging from fungal infections in wood to freeze-thaw damage in stone. A comprehensive review of more than two hundred studies on historical masonry shows that moisture, whether it reaches the structure through wind-driven rain, capillary action from the ground, or condensation on cold surfaces, is the main cause of progressive deterioration and the long-term loss of structural strength in walls (Mahato et al., 2026).

A traditional wall can absorb a large portion of rainfall if the rain pattern is regular. However, if the same amount of rain falls in fewer but more intense storms, the water absorption capacity of the wall can be exceeded. At the same time, warmer air retains moisture longer between storms, slowing the drying process. Therefore, what damages the building is not the total amount of annual rain, but how it is distributed throughout the year. The Alpine data on this topic is very specific and reveals something unexpected. A study of 299 high-mountain weather stations across the Alps shows that intense, short-duration summer rainstorms are increasing by about nine percent for every degree of warming. Unexpectedly, this intensification is stronger at higher altitudes (Peleg, Koukoula, & Marra, 2025). If the region warms by two degrees compared to the 1991-2020 average, extreme storms that used to happen once every fifty or a hundred years will occur twice as often. Detailed forecasts for the Italian Alps also predict more frequent heavy rainfall days, with the biggest increases happening in the most extreme categories (Blavier et al., 2025). While altitude protects mountain buildings from heat and fungal decay, it offers no protection here.

Two specific features of Pedemonte make this situation even worse. The houses are built with their longest side facing south. This orientation exposes their largest walls to the strongest sunlight, but depending on the wind, it also exposes them to the heaviest wind-driven rain in the valley. Historically, this single design choice served two purposes that climate change is now splitting apart; the orientation that maximises winter sunlight also maximises exposure to the most rapidly intensifying storms. Additionally, the village is located at the top of a valley beneath Monte Rosa. Here, air is forced upward against the mountains, causing it to cool and drop more rain than in the surrounding lowlands.

Studies about historical buildings in other parts of the Italian Alps have shown that high humidity levels are recorded for extended periods in exposed, high-altitude locations. Researchers argue that despite the high sensitivity of porous building materials, the Alpine regions are still not sufficiently studied (Rosina, Zala, Ammendola, & Esmaeilian Toussi, 2025).

> The concentration of precipitation has been directly recorded at 299 Alpine weather stations, including those in Italy, which is the most reliable evidence in this section. Furthermore, the predominantly south-facing orientation of Pedemonte houses has been directly observed. However, anything connecting these two points, such as which specific storm directions actually hit south-facing walls and how quickly they dry, is purely theoretical. A formal study using instruments to measure wetting and drying rates on building facades in Pedemonte could easily resolve this, but unfortunately, no such study exists.

1.5.3 Freeze-thaw action

The freeze-thaw effect is the result of moisture combining with temperatures hovering around the freezing point. Water penetrates the tiny pores of the stone or mortar, and then it becomes trapped. When freezing occurs, it expands by approximately nine percent, beginning to damage these pores. After each freeze, small cracks open, and they allow more water to enter during the next thaw. Each thaw prepares the material for the next freezing cycle (Mahato et al., 2026). The damage is gradual rather than sudden. Every cycle widens the cracks left by the previous one. This explains why a wall can look completely fine for years and then suddenly collapse once the cracks grow large enough to connect.

This process depends on how many times the temperature crosses the freezing point, rather than how cold it gets. What actually damages the stone is the number of times the material goes through zero degrees. Therefore, this mechanism is a direct measure of temperature variability around a specific limit. A winter that stays continuously frozen causes almost no freeze-thaw damage, no matter how harsh it is. Across most of lowland Europe, global warming reduces the number of days when the temperature crosses the freezing point, so the risk of frost damage there is decreasing. At higher altitudes, scientists expected the opposite to happen. Places that used to stay frozen throughout long, continuous winter months can now thaw during warm spells and refreeze at night. This increases the number of damaging cycles in a single season (Grossi, Brimblecombe, & Harris, 2007).

Snow cover is connecting this issue to the evidence presented in Section 1.4. A lasting layer of snow piled against the base of a building actually insulates it. Under the snow, the wall stays at a fairly steady temperature close to zero. It is protected from the fluctuating air temperatures above. As a result, a wall covered in snow all winter goes through very few freeze-thaw cycles, regardless of how cold the air gets. However, when the snowpack thins out, arrives later, or melts and reforms multiple times during the season, this protective buffer is lost. The same wall then faces every warm spell and every night frost directly.

Despite this logical reasoning, the projected changes in the Alps do not match these expectations. This difference is very important for the main argument of this thesis. High-resolution predictions were generated for the Italian Alps using regional climate models under two different emission scenarios. These predictions show that freeze-thaw cycles are actually decreasing rather than increasing. This decrease could be as much as a quarter. This decline is sharpest in the valleys, where temperatures are moving above the narrow range where freeze-thaw can even happen (Blavier et al., 2025). The same study found that the wet-frost index, which measures rainfall followed immediately by frost, is also decreasing across the entire region. Only at very high altitudes does the situation remain uncertain. This is because the number of days hovering around zero remains high in those areas, and climate models disagree on the exact direction of the change.

Pedemonte is located at 1200 meters. It is closer to the foot of the valley than the high mountains. It is indicated in the best available evidence that the number of freeze-thaw cycles affecting its buildings is stable or decreasing rather than increasing.

However, two important details indicate that problems still exist.

First, the decrease in the total number of freezing cycles alone is not a good indicator, and the real danger lies in unpredictable cycle times. As the protective snow cover disappears with climate change, freezing cycles can now reach building materials that were previously protected.

Second, these climate projections are based on Trentino and South Tyrol, which are located about 300 kilometres east of Valsesia. Currently, no similar mapping exists for the Piedmont region. Despite these limitations, this conclusion is worth stating clearly because it contradicts the common belief that global warming automatically makes every part of a historic building more vulnerable. It simply does not. The stone base and its mortar joints are still the most exposed parts to any freezing that occurs. This is where water naturally gathers and freezes, and it is also the area that the winter snowpack used to protect. However, the physical stress on these elements is not actually getting worse. Even so, Chapter 3 will show that the stone base is one of the most frequently altered parts of the surveyed buildings, featuring replaced doors, paved entrances, modern external stairs, and metal railings. If a physical threat is not intensifying but the building part keeps changing, there is only one logical explanation: the climate is not to blame. This is the first point in the thesis where the main finding is proven by physical evidence rather than just theoretical argument.

> The expected drop in freeze-thaw cycles is based on high-resolution models from a different Alpine area. The assumption that Pedemonte behaves more like a valley than a high-mountain peak relies entirely on its altitude. Meanwhile, the insulating power of snow on stone walls is a proven physical fact. The lack of detailed climate maps for Piedmont at this resolution is a confirmed research gap, not just an oversight in this study.

1.5.4 Biological decay of timber

Biological decay is the breakdown of timber by fungi. It differs from the mechanisms above because it is not a force acting on a material. *It is something alive, and like anything alive, it needs conditions. Decay fungi need moisture in the wood above roughly twenty percent of its dry weight, temperatures above about five degrees Celsius, oxygen, and the wood itself to feed on.* Take away any one and decay effectively stops, which is why dry timber under a deep overhang lasts for centuries while the same timber standing in wet ground fails in a few years. Climate change acts on two of those conditions at once, and this is the one mechanism here where a rise in the average is itself the threat. Warming lengthens the part of the year when temperatures sit above the biological threshold, so the decay season grows at both ends. More humid and heavier rainfall more frequently meets the moisture needs of fungi. The environmental conditions in the Alps are also progressing in this direction due to climate change. Therefore, timber decay is becoming a reality that should be a concern for this region.

The Alpine evidence points more consistently in one direction here than for any other mechanism. Projections for the Italian Alps show the Scheffer index rising substantially through the century, by about half as a regional average under the higher emissions scenario, with conditions most favourable to decay reaching the main valleys first and the smaller ones later (Blavier et al., 2025). The index estimates fungal decay hazard in above-ground timber from monthly temperature and the number of rainy days. The same projections show growing degree days increasing, which points to more activity from the insects that attack structural timber. Studies outside the Alps agree, in the United Kingdom, where the climate-based decay hazard has already risen and is projected to rise further (Curling & Ormondroyd, 2020), and in Norway, where recent warming has increased the potential for decay in exposed wooden structures (Grøntoft, 2019).

Where this mechanism starts from matters as much as where it is going, and here altitude has been working in the building's favour. European mapping of decay hazard puts the Alps among the lowest-hazard environments on the continent, far below the lowlands and the major valleys (van Niekerk, Marais, Alfredsen, & Brischke, 2024), and a Swiss study measuring the Scheffer index across altitude found it dropping to effectively zero at the highest stations while exceeding seventy at low elevation (Brischke & Selter, 2020).

Alpine timber has lasted as long as it has partly because cold kept the fungi suppressed for most of the year. Altitude has been doing conservation work that nobody designed and nobody has had to maintain, and what climate change does to timber is withdraw that protection. A protection that is withdrawn is much harder to notice than a threat that arrives. The same Swiss study found that in steep, broken terrain the hazard changes sharply over very short distances, enough to alter the expected service life of a component, so a single figure for the Valsesia would not describe Pedemonte, and a figure for Pedemonte would not describe a north-facing wall inside it. No decay dose has been calculated for the hamlet, and that fine-scale variation is a specific reason why one would be needed before making any confident local prediction.

What this mechanism reaches is any timber that stays wet. It concentrates at joints and interfaces rather than spreading evenly over a surface, so a beam resting on damp masonry, a notch where two logs interlock, and a joint where one member meets another all fail first while the timber around them still looks sound. This mechanism also answers to maintenance more than any other described here. Masonry exposed to freeze-thaw decays at a rate the climate mostly sets. Timber decays at a rate set by whether a roof still throws water clear of it, whether its joints stay sealed, and whether damaged members are replaced before the damage spreads. Where traditional maintenance continues, timber survives a worsening climate. Where it lapses, or where non-traditional materials trap moisture against the wood instead of letting it dry, decay runs well ahead of what the climate alone would predict. Even for the one material whose physical situation is genuinely deteriorating, the outcome still rests with the owner.

1.5.5 Snow and wind loading

Roofs are designed according to the loads that need to be carried, and in the mountains, the main load will be snow. The Walser roof was designed to bear a large and persistent winter snow cover, and it was covered with massive stone slabs also in order to give weight to the roof to counterbalance both the weight of snow and wind pressure. This is the design that was adjusted to the particular and stable cycle of events – snow that falls during the winter, stays there for a long time, and releases its load gradually in spring. The difference between the two situations splits the average load from the peak one in opposite directions. Winter snowfall is decreasing all across the Alps (Matiu et al., 2021).

At the same time, the snow that still falls tends to be heavier and wetter, or even fall as rain on the pre-existing snow. Wet snow is much denser than the dry one, and thus the thinner layer can become the significant burden. Rain falling on the pre-existing snow cover increases weight without changing depth. The roof, which is designed for heavy snow accumulation, has been over-designed for the typical snow season and under-designed for the occasional heavy and brief accumulation. The average amount of snow is falling but the maximum is increasing. The building is designed for the average.

The structural impacts have been analyzed directly in Italy and Europe in order to develop the new Eurocode revisions. Analysis of ground snow loading based on Italian observations and projections of regional climate indicates that the extreme snow load changes are site-specific and that some sites experience an increase in snow loading and other sites experience reductions in snow loading, while the reliability of buildings built according to the earlier code is declining with increasing extreme loads (Croce et al., 2018; Croce, Formichi, & Landi, 2021). In the case of French Alps, comparison of projected extreme snow loads and the building codes indicates inconsistencies between the two (Le Roux et al., 2020).

However, the literature in question involves structures that have been engineered according to a code, making it somewhat tangential but still relevant to the topic at hand. The roof in question was never engineered with a particular code in mind. The margin of safety in this case relies on the judgement of the craftsman and the experience of the winters that came before, and the experience represents a record of a previous distribution. While an engineer can change his design values in the event that the distribution changes, the vernacular tradition cannot for the simple reason that the means through which it learned have been stopped. The concentrated load in the Walser house acts directly on the roof structure, the overhangs over the gallery, and the stone slabs, which are meant to be stable under a constant load and not under repeated loading and unloading.

A reduction in the snow depth in the Alps has been recorded. Models of changing extreme snow loads have been created, using stations in Italy. There has been no calculation of the load for a Pedemonte roof, nor does any of the literature cited deal with stone slab roofs, which behave differently from those assumed by the models.

1.5.6 What the mechanisms show together

Four findings come out of these five, and the rest of the thesis relies on them.

They do not move together. Moisture and biological decay are worsening at Pedemonte. Thermal stress is worsening in a narrower way, through a widening daily range rather than a higher mean. Snow loading is changing shape instead of amount, lighter on average and heavier at the extreme. Freeze-thaw, on the best evidence, is easing. So any account that treats a warming climate as pressing uniformly on an old building is wrong, and it is these differences that make an element-by-element reading necessary rather than merely tidy.

The second finding is a crucial one that sets the tone for the rest of this thesis. With one exception, what threatens these buildings is not the increase in the mean value, but the increase in variance. Thermal stress depends on the magnitude of the oscillation. Freeze-thaw depends on the number of transitions. Humidity depends on how the rainfall is distributed throughout the year. Snowfall depends on the widening of the distance between a falling average and a rising peak. Only biological degradation is primarily driven by a change in the mean value. It is driven this way because what holds it back is not a cold day, but a cold season. A conventional building is calibrated not according to a level, but according to a pattern of conditions. Because its materials and maintenance cycle also change in parallel, it is badly affected by a slow shift and irregularity in averages. This means a loss of predictability for a building, and this is the specific climatic condition that is addressed as decisive in this thesis.

None of this remains constant, and predictions show how it will change. If regional warming increases by two degrees, the frequency of extreme short-duration summer downpours across the Alps could double, with the strongest concentrations occurring at higher altitudes. Therefore, a storm that occurs once every fifty years today would happen twice as often (Peleg, Koukoula, and Marra, 2025). During the same period, freeze-thaw days in the Italian Alps would decrease by about a quarter, while the risk of fungal rot in timber would increase by about half (Blavier et al., 2025). Design snow loads move in different directions in different regions, and where extreme loads increase, structures built to earlier standards would consequently lose their reliability (Croce et al., 2018; Le Roux et al., 2020).

All of this, taken together, means that the pressure on such a building will not only continue but will change shape: less frost, more rot, heavier rainfall, and a snow load where the average and peak points move further apart. What was recorded in eight buildings in Chapter 3 is an early stage of this; this makes the question posed in the thesis a question for the future.

The last finding carries furthest. The mechanism acting on masonry at ground level is not intensifying, and Chapter 3 will show that this is among the most consistently altered parts of the surveyed buildings. The mechanism acting on timber is intensifying, and the same chapter will show that whether a timber element survives depends on whether its owner maintains it. In neither case does the climate decide the outcome. What this section establishes is what is happening to the buildings of Pedemonte. It cannot explain what has been done to them. That needs the conflict between conservation and habitability set out in Section 1.3, and Section 1.6 now brings the two together.

Mechanism	Driven by	Direction at Pedemonte	Element most affected	Evidence distance
Thermal stress	Range	Intensifying	Gallery, exposed frame	Alpine review
Moisture	Distribution	Intensifying	Stone base, sills, joints	Measured at Alpine stations
Freeze-thaw	Crossings	Stable or easing	Stone base, mortar joints	Italian Alps, 300 km east
Biological decay	Season lengthl	Intensifying, strongly	Sills, joints, gallery members	Gradient measured, Switzerland
Snow loading	Peak against mean	Changing in shape	Roof, eaves, slab covering	Italian stations

[Fig 1.7] The five mechanisms, their dominant driver, and their direction of travel at Pedemonte.

1.6 Climate change and the vernacular built environment

This chapter has worked in two registers. Section 1.3 established a distinction between monument and diffused vernacular heritage. It explains the purpose of monuments and how they do not have to meet modern standards of habitability, while explaining diffused vernacular heritage and why it does have to meet modern standards of habitability. Sections 1.4 and 1.5 explained the Alpine climate is warming, becoming less regular, and shifting the mechanisms of stress and decay that act on a traditional building. One register is social and legal. The other is physical and meteorological. This section argues that they are not separate, because they meet in the same object, and the object is the inhabited vernacular building. The asymmetry between two categories of heritage does not depend on climate change. A monument does not need modern standards because nobody lives in it. A diffused vernacular building has always had to serve to its users who needs warmth, light, safety and convenience. The pressure to modernise these buildings is therefore older than any measurable Alpine warming, and it would exist in a perfectly stable climate.

The easiest way to understand this is to compare two buildings side by side. For instance, the walser museum in pedemonte standing next to a regular, lived-in house. Both buildings experience the exact same physical conditions described in section 1.5. They share the same altitude, rainfall, snow, and wood decay. Physically, they are identical. However, their purposes are completely different. If the museum's wooden beams get wet, the only expectation is to replace them with identical wood, keeping the building exactly as it was. But if the same beams get wet in the house next door, the owners have a dilemma. They need to fix the wood, but they also need the room inside to be warm, dry, legally compliant, and affordable to heat. The museum only has to preserve its history, while the house must balance preservation with modern living standards.
This explains why climate change impacts buildings differently, even when they face the same physical weather. traditional architectural features are usually left untouched as long as they are cheap to maintain. For example, an old drying gallery costs very little to keep when winters are predictable, and heating is cheap. However, as the climate becomes more extreme, these costs rise. The wood decays faster, the walls lose heat, and repairs are needed more often. Just as it becomes too expensive to do nothing, conservation laws still demand that the building remains unchanged. The owner is trapped between strict heritage rules and the practical need to upgrade the house.

This mechanism can be quantified. Alagna Valsesia falls in Climate Zone F, the coldest of Italy's six zones, with 3,877 heating degree-days (Comune di Alagna Valsesia, n.d.). For this zone, the law sets a maximum wall U-value of 0.33 W/m²K under the original D.Lgs. 192/2005. The current requirement is stricter still, at 0.26 W/m²K (Decreto Requisiti Minimi, 2026). A traditional Blockbau wall does not come close to either number. Built from solid larch, 15 to 20 centimetres thick as described in Section 2.3.3, its calculated U-value sits around 0.65 to 0.75 W/m²K. This uses larch's known thermal conductivity, 0.13 to 0.15 W/mK, and standard surface resistances under ISO 6946. So the traditional wall, left as it is, loses heat at two to three times the legal limit. That is not a small gap to close. It is the exact distance an owner must make up whenever a room becomes a year-round living space — and it is what "raising the cost of leaving an element unchanged" actually means, in numbers.

Section 1.5.6 explained why ignoring these issues is becoming so expensive. The main problem is not just warmer weather, but unpredictable weather. Traditional buildings were designed for specific, reliable seasonal patterns. Their maintenance cycles also relied on this predictability, for example, wood was treated, and roofs were checked right before winter arrived. When the weather becomes unpredictable, both the building's design and its maintenance routine fail. Since a building's survival depends more of maintenance than the weather itself (as shown in section 1.5.4), this loss of predictability is the most destructive climate factor discussed in this thesis. This situation will likely get worse. A 2025 study of high-altitude areas in the Alps found that a 2-degree rise in temperature could double the number of extreme summer rainstorms (Peleg, Koukoula, & Marra, 2025). Traditional stone roofs, which were built to slowly melt snow, cannot handle this kind of sudden, heavy rain. As a result, the damage currently seen in the eight buildings studied in chapter 3 is only the beginning of a long-term trend.

Two main conclusions form the foundation for the rest of this thesis. First, climate change is a trigger, not a direct cause. Extreme weather rarely destroys a traditional building element completely. Instead, it makes maintenance so expensive that the owner is forced to change the building. The historical damage is therefore caused by human intervention, not the weather. For instance, as noted in section 1.5.3, owners frequently alter the stone bases of their homes, even though the weather acting on them hasn't worsened. Second, the conflict is not spread equally across the building. Some parts are exposed to harsh weather but aren't historically important, so they can be easily replaced.

Other parts are very historic but aren't exposed to bad weather. The real problem occurs when a single building element is highly exposed to the weather, essential to the building's historical identity, and strictly protected by conservation laws. To identify these problem areas, we must analyse exposure, identity, and regulations separately. The next section explains how to do this, before Chapter 2 applies the framework to the architecture of the Walser House.

1.7 A framework for reading the conflict

The argument of this chapter implies that the research question cannot be answered for the house as a whole. It has to be answered element by element, because the pressures described above fall unevenly across the building and because an answer given for the house would average away the very unevenness that matters. This section sets out the framework used for that reading. It holds three variables apart, applies them to each element in turn, and asks where they coincide.

1 **Vulnerability**

Vulnerability is the element's physical exposure to the mechanisms set out in Section 1.5. It is a question about material and position, and it has three parts: which mechanism dominates for this element, how severe that mechanism is at Pedemonte now, and whether it is intensifying. The stone base is exposed to freeze-thaw because it stands at the foot of the wall where water gathers, though Section 1.5.3 has shown that the mechanism is not worsening. The timber body is exposed to biological decay because it is timber and because a lengthening warm season lengthens the season in which decay is active. Vulnerability is established from evidence about the climate and the material. It does not depend on what anyone values, and it can fall as well as rise.

2 **Significance**

Significance is the weight of cultural identity the element carries. It is a question about legibility: if this element were removed or replaced, would the building still be recognisable as a Walser house. Significance is not the same as structural importance, and confusing the two is the most common error in reading a vernacular building. A foundation can be essential and invisible at once. A timber screen can be structurally trivial and still carry the whole recognisable character of the type.

3 **Regulation**

Regulation is what the rules permit, require, or forbid for the element. It is a question about legal room: whether this element may be altered, whether it must be altered in order to satisfy habitability, energy or safety standards, and whether it has to remain exactly as it is. As Section 1.3 showed, regulation acts in both directions at once. The Codice and the Piano Paesaggistico Regionale hold identity-bearing elements in place. Housing and energy standards press for their alteration. The same element can therefore be protected and pressured by law simultaneously, and the owner receives both instructions from the same state.

This is not a new method. Assessing cultural significance before deciding how to intervene is the basis of values-based conservation, and it has been formal doctrine since the Burra Charter, first adopted in 1979 and revised in 2013 (Australia ICOMOS). What this framework does differently is narrower, and worth stating plainly. The Burra Charter keeps significance apart from regulation deliberately. Its own guidelines state that a significance judgement should not take legal constraints into account at all; that question belongs to a separate, later stage of conservation policy. This framework does the opposite, reading vulnerability, significance and regulation together, at the same time, because the argument developed here depends on where the three land on a single element rather than on any one considered alone. The Burra Charter also assesses significance at the scale of a place, typically a whole site or building. This framework applies the same judgement at the scale of the individual element. Section 1.2 has already shown that one building can hold elements of markedly unequal significance, and it is that unevenness, not any property of the house as a whole, that the argument depends on.

The three variables are independent of one another, and that independence is what makes the framework useful rather than merely descriptive. Four combinations arise, and only one of them constitutes a conflict. An element with high vulnerability and low significance presents a maintenance problem rather than a conservation dilemma, because it can be repaired or renewed as often as necessary without any loss of character. An element with high significance and low vulnerability is culturally central but under no particular physical threat, so it is unlikely to force a decision at all. An element that is both vulnerable and significant, but that regulation leaves room to adapt, is a design problem, and a solvable one. Conflict arises only in the fourth case, where an element is heavily exposed, carries the identity of the type, and is held in place by regulation that also demands it perform to a modern standard. There the owner is required to do two incompatible things, and something has to give. Stated in this form, the framework produces a claim that the rest of the thesis can test rather than a description it can only illustrate. If the conflict is selective rather than total, then most of the Walser house should prove adaptable within the rules, and the difficulty should concentrate in a small number of elements, perhaps only one. If instead the three variables run together across the whole building, the conflict is general, adaptation is impossible within the current regime, and the thesis would have to say so.

	Vulnerability	Significance	Regulation
The question it asks	How exposed is this element to physical decay?	How much of the building's identity does it carry?	What do the rules allow, require, or forbid?
Where the evidence comes from	Climate mechanisms, Section 1.5	Building type and visual legibility, Sections 1.2 and 1.3	Heritage, landscape and habitability law, Section 1.3
Established by	Material and position	What a viewer can read	What an owner is permitted to do
Direction of pressure	Toward decay	Toward retention	Both, simultaneously

[Fig 1.8] The three variables used to read each element of the Walser house. Conflict is defined as the coincidence of all three.



C.2

Walser architecture in Pedemonte



2.1 Mapping surviving Walser architecture in Europe

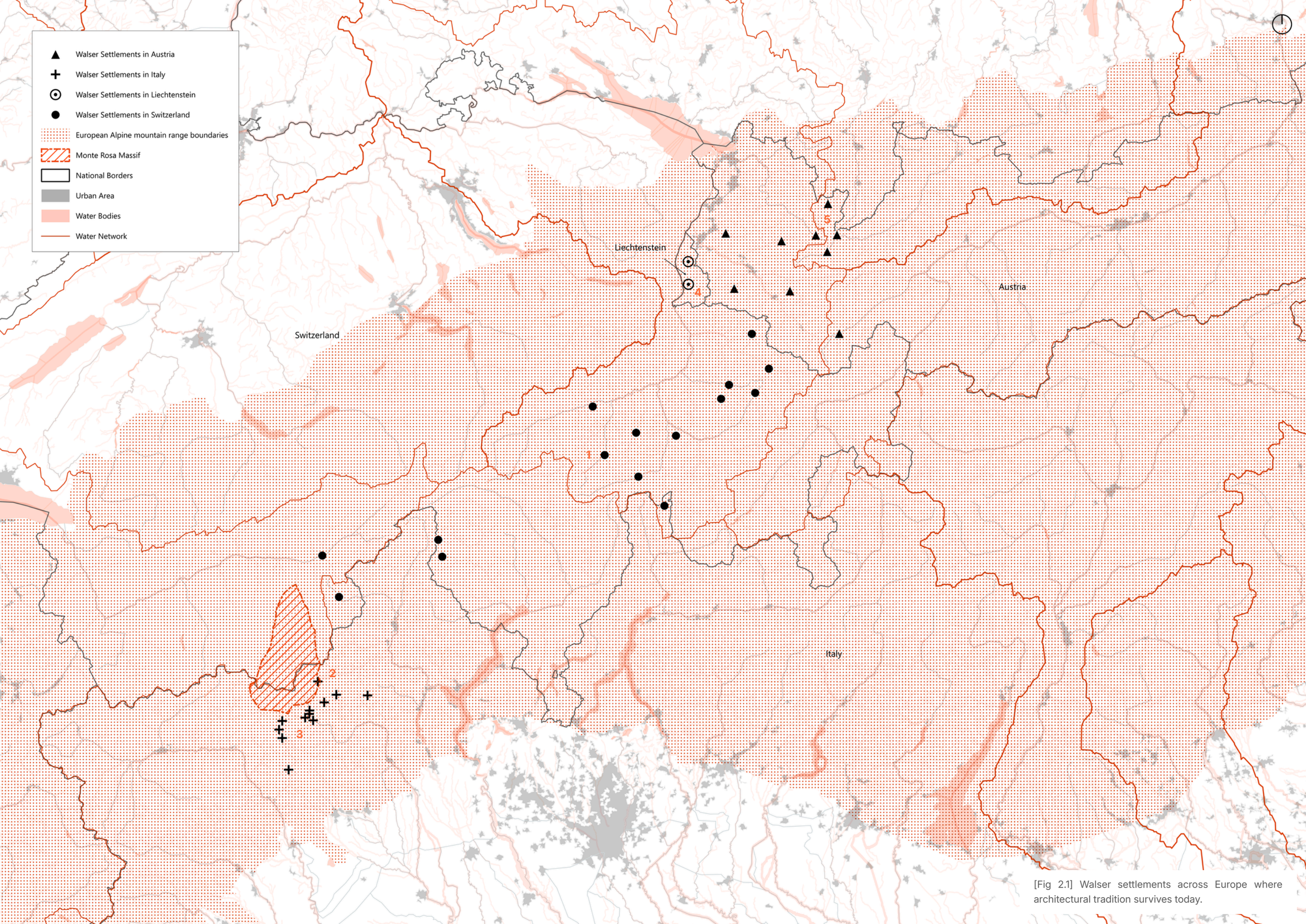
2.1.1 Where the tradition survives

The Walser diaspora reached about 150 places across the Alps between the twelfth and fifteenth centuries, covering the Upper Valais and parts of what are today Italy, Switzerland, Liechtenstein and Austria. The map of where the Walser once lived, however, is no longer the same as the map of where their architecture can still be seen. Over the intervening centuries many communities lost their dialect, were absorbed into surrounding cultures, or saw their houses replaced by later construction.

That loss is a subject in its own right, but it lies outside what this thesis can examine. The questions asked here, how a living building responds to a changing climate and how it holds its identity while it changes, can only be asked of buildings that are still standing. The maps that follow therefore record where Walser architecture survives today, without implying that the places outside them are of no interest.

The maps draw on the network of Walser museums, ecomuseums and protected heritage sites that make the tradition publicly visible across the four countries where it remains. These institutions provide the record, since the buildings they hold, care for or document are the ones that can be verified as surviving Walser architecture. That the record and the survival should be so closely linked is not incidental, and Section 2.1.2 returns to it.

Fig 2.1 shows the full European picture: every site where surviving Walser architecture can be documented today, from the Upper Valais homeland in the west to the Tyrol in the east, with the Monte Rosa cluster in which this thesis is set highlighted. Read at a glance, the map shows a diaspora that has contracted into a small number of dense points rather than thinning evenly across its historical range. The country sections that follow move from Italy to Switzerland, and then to Liechtenstein and Austria, each accompanied by a closer map of its own.



[Fig 2.1] Walser settlements across Europe where architectural tradition survives today.

The range of the type.

Before turning to the geography, it is worth seeing what this architecture actually looks like across its range, because the variation matters for how a single hamlet can be read. The plates that follow show a stadel raised on stone caps in Val Formazza, the timber house museum at Macugnaga, a Walser house on the village square at Vals in Graubünden, the timber-and-plaster building of the Walsermuseum at Triesenberg, and a Walser house in Alagna Valsesia. They share common materials, stone and larch, and a common structural logic, but each answers its own valley in its own way. Roof pitch, the treatment of the base, the presence or absence of a wrapping gallery, and the proportion of timber to masonry all vary from one settlement to another.

This variation is what makes the tradition living rather than fossil, and it establishes the terms on which the rest of this thesis proceeds. The Walser house of Alagna is one variant among several, so a study of a single hamlet is a study of one instance of a wider condition rather than of an isolated curiosity. The pressures identified in Pedemonte are therefore likely to be recognisable, in altered form, wherever this architecture survives.

1



[Fig 2.2] Walser house in the village square of Vals GR. (Wikimedia)

2



[Fig 2.3] Museo casa Walser a Macugnaga, frazione Borca, prov. Vco, Piemonte. (Wikimedia, 2022)

3



[Fig 2.4] Walser House in Alagna Valsesia. (https://visitvalsesiavercelli.it)

4



[Fig 2.5] Walserhaus in Triesenberg, Liechtenstein. (Von Wikiolo - Eigenes Werk, Wikimedia.)

5



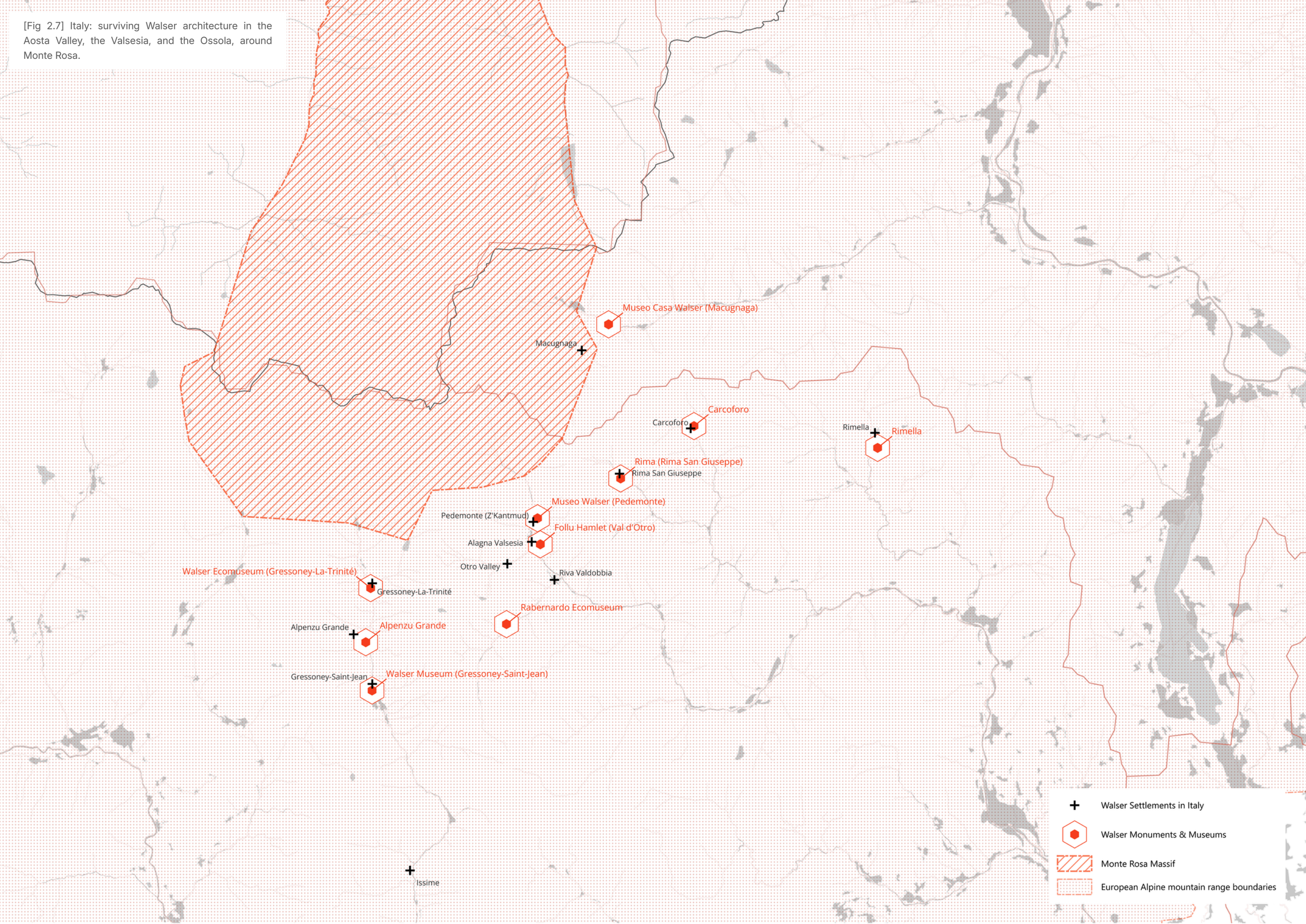
[Fig 2.6] Walser museum in Riezlern, Austria. (https://www.kleinwalsertal.com)

zoom-in / Italy

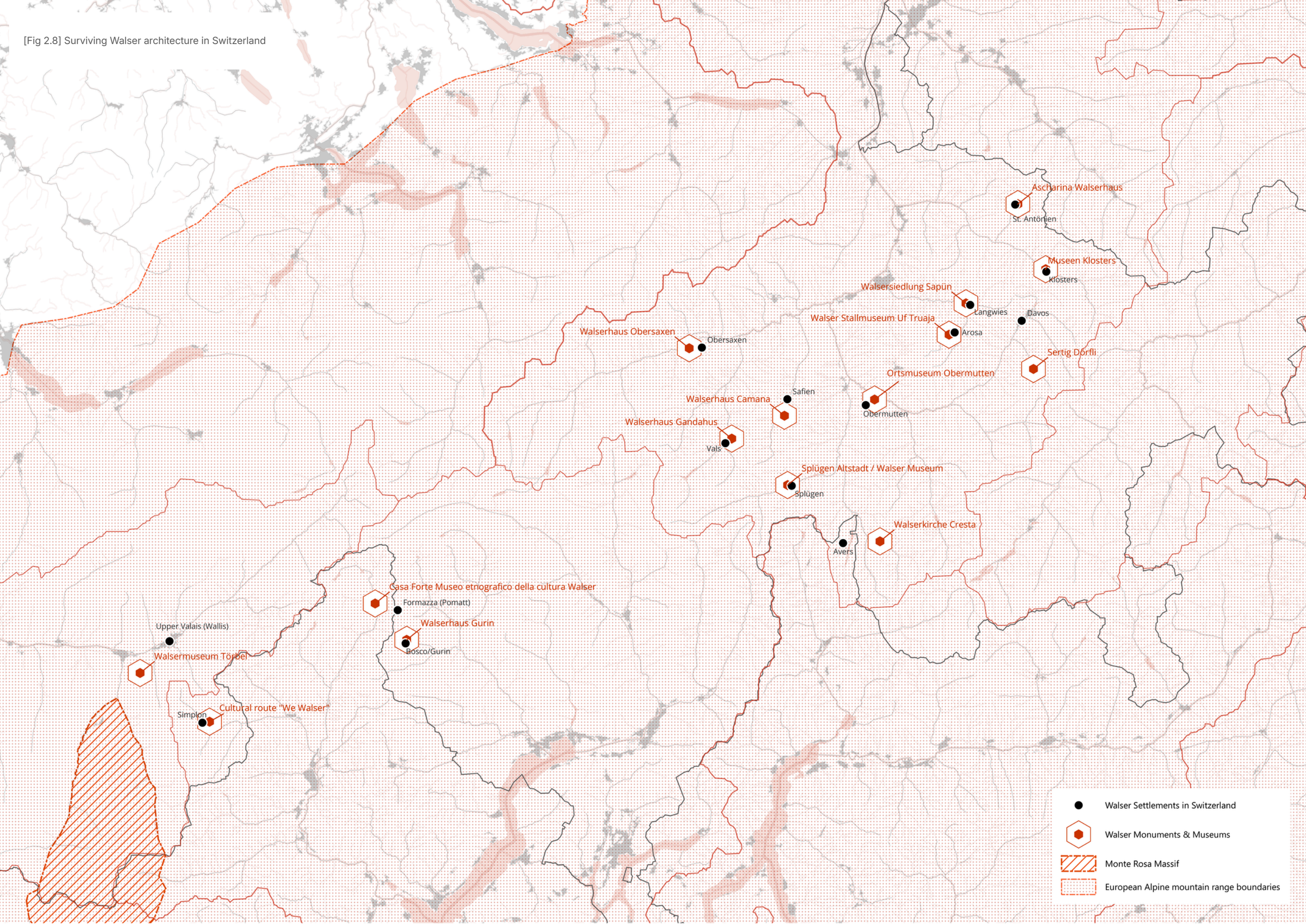
The densest and most institutionally supported concentration lies around Monte Rosa, on the Italian side of the massif, shown in Fig 2.7. In the Aosta Valley, the Valle di Gressoney holds an active network of documented buildings. Gressoney-La-Trinité preserves the eighteenth-century Puròhus, the Pòtzschhus stadel and the Binò Alpelté dairy hut, held together by the Walser Ecomuseum (Comune di Gressoney-La-Trinité, n.d.; Lovevda, n.d.). A short walk above the valley, the hamlet of Alpenzu Grande preserves thirteen dwellings dating to 1668 as an intact ensemble (Italia.it, 2024). Further down the same valley, Issime preserves both the töitschu dialect and, at the Vallone di San Grato, a group of stoadal buildings. In Piedmont, the Ecomuseo di Valsesia extends the same institutional logic across Alagna Valsesia, Rimella, Rima San Giuseppe, Riva Valdobbia and Carcoforo (Visit Valsesia Vercelli, 2023). The Ossola, on the eastern flank of Monte Rosa, holds the Walser House Museum of Macugnaga, a seventeenth-century timber building considered among the best-preserved examples of Walser architecture in Piedmont (VisitOssola, n.d.). Formazza, at the head of the Val Formazza, preserves both a Walser-speaking community and its characteristic stadel architecture.

What distinguishes the Italian cluster is not the number of buildings but the density of institutions around them. Almost every surviving group here sits inside an ecomuseum, a museum network or a protected designation. Pedemonte, the subject of this thesis, lies within that pattern rather than outside it.

[Fig 2.7] Italy: surviving Walser architecture in the Aosta Valley, the Valsesia, and the Ossola, around Monte Rosa.



[Fig 2.8] Surviving Walser architecture in Switzerland



zoom-in / Switzerland

Beyond Monte Rosa the tradition survives more sparsely, as Fig 2.8 shows. The outstanding case is Bosco/Gurin, the only remaining Walser village in Ticino, whose houses have been preserved around the Museum Walserhaus, a building of 1386 that is among the oldest surviving farmhouses in the country (Museum Walserhaus, n.d.). In Graubünden, the largest cluster of Swiss Walser settlements survives with visibly different degrees of protection. Vals, Obersaxen, Safien, Splügen, Avers, Langwies, Obermutten and St. Antönien retain their traditional character in continuous daily use. Davos and Arosa, Walser in origin, have been so heavily overwritten by resort development that their Walser character is now residual. The homeland itself, the Upper Valais, still preserves Walser architecture in continuous use in villages such as Simplon and in the isolated valleys of the Lötschental and Goms.

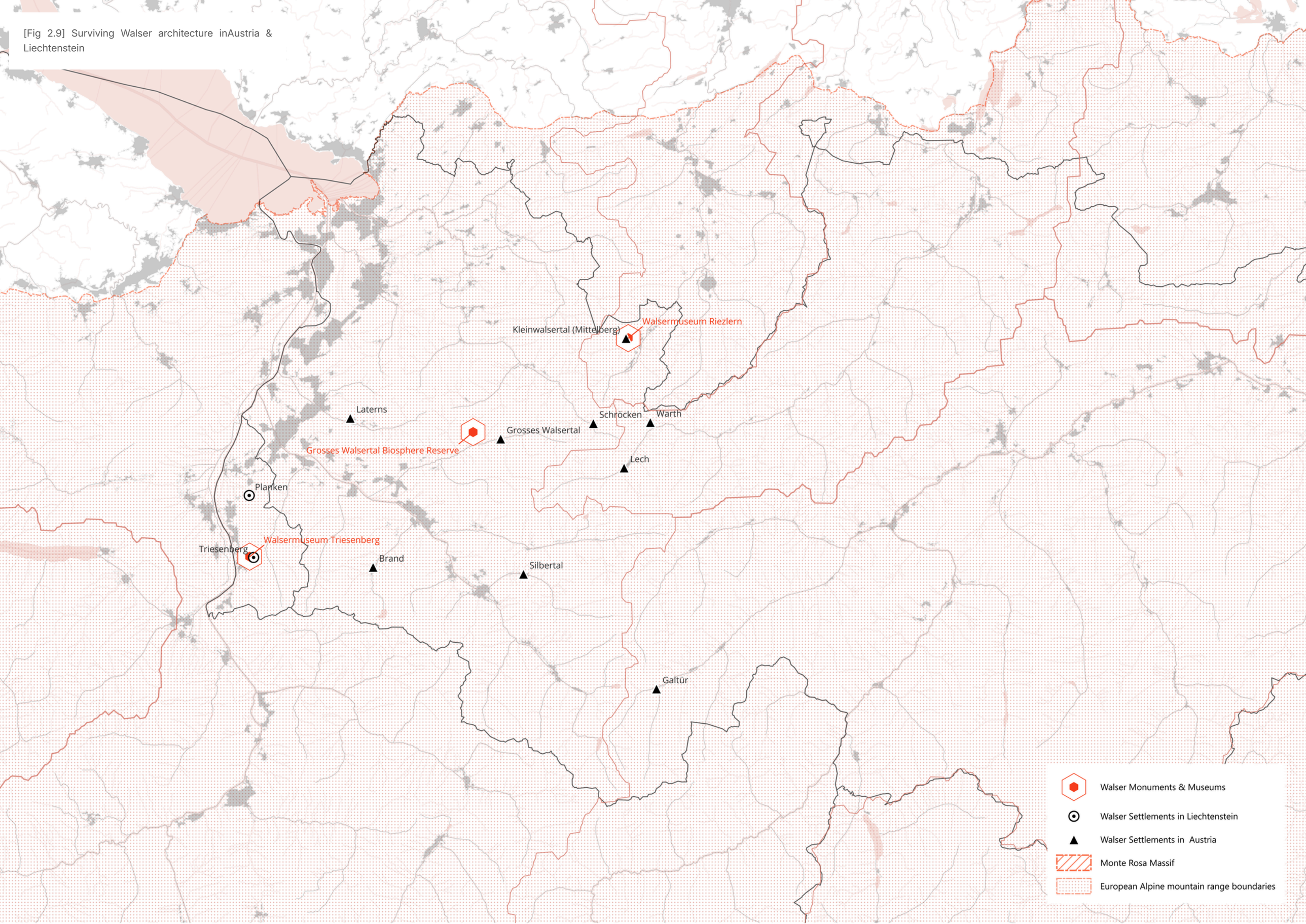
The contrast between Vals and Davos is the most instructive comparison on any of these maps. Both were Walser settlements, both sit in the same canton, both experienced the same century of Alpine tourism. One retains its building stock and one has effectively lost it. Whatever separated them was not climate, altitude or building tradition, all of which they shared.

zoom-in / Austria & Liechtenstein

In Liechtenstein the tradition survives at Triesenberg, high above the Rhine valley, where the Walsermuseum documents nineteenth-century Walser domestic life in a preserved timber building on a base of mud-brick masonry (Walsermuseum Triesenberg, n.d.). Triesenberg and the neighbouring settlement of Planken are the only communities in the principality that maintain the dialect and the building tradition together.

In Austria the fullest concentration lies in the Vorarlberg, on the western edge of the country, shown with Liechtenstein in Fig 2.9. The Grosses Walsertal, protected since 2000 as a UNESCO Biosphere Reserve, holds six Walser villages, Blons, Fontanella, Raggal, St. Gerold, Sonntag and Thüringerberg, in continuous daily use. Further Walser architecture survives in the Kleinwalsertal, the Brandnertal, the Silbertal in the Montafon, on the Tannberg at Lech, Warth and Schröcken, and, easternmost of all, at Galtür in the Paznauntal. The Kleinwalsertal is a particular case, since its Walser village of Mittelberg lies geographically inside Germany while remaining administratively and culturally part of Austrian Vorarlberg.

[Fig 2.9] Surviving Walser architecture inAustria & Liechtenstein



2.1.2 What the survival pattern shows

Reading the four maps together makes a pattern visible that shapes the rest of this thesis. Surviving Walser architecture is not spread evenly across the historical diaspora. It is concentrated in a small number of specific places, and those places are almost all sites where a community has organised itself to keep its buildings visible and documented. In Italy the Monte Rosa cluster is at once the densest and the most institutionally supported. In Switzerland the contrast between Vals and Davos shows the same logic operating inside a single canton. In Liechtenstein a single museum and a single community hold the tradition in one place. In Austria a UNESCO Biosphere Reserve protects six villages at once as a cultural landscape. Across all four countries the correlation holds.

This is a suggestive pattern rather than a proof. The evidence is a set of surviving sites and their institutional associations, not a controlled comparison, and the direction of causation cannot be established from a map. Institutions may preserve buildings, or surviving buildings may attract institutions, and in most of these places the two have probably reinforced each other over decades. But the consistency of the pattern across four countries makes it worth carrying forward as a working hypothesis.

It also reframes what adaptation means for vernacular heritage. If survival depends in part on whether someone chooses to protect the buildings, then adaptation is not only a technical question about materials and climate performance. It is a question about who cares enough to make those choices, and about what the rules allow them to do once they have.

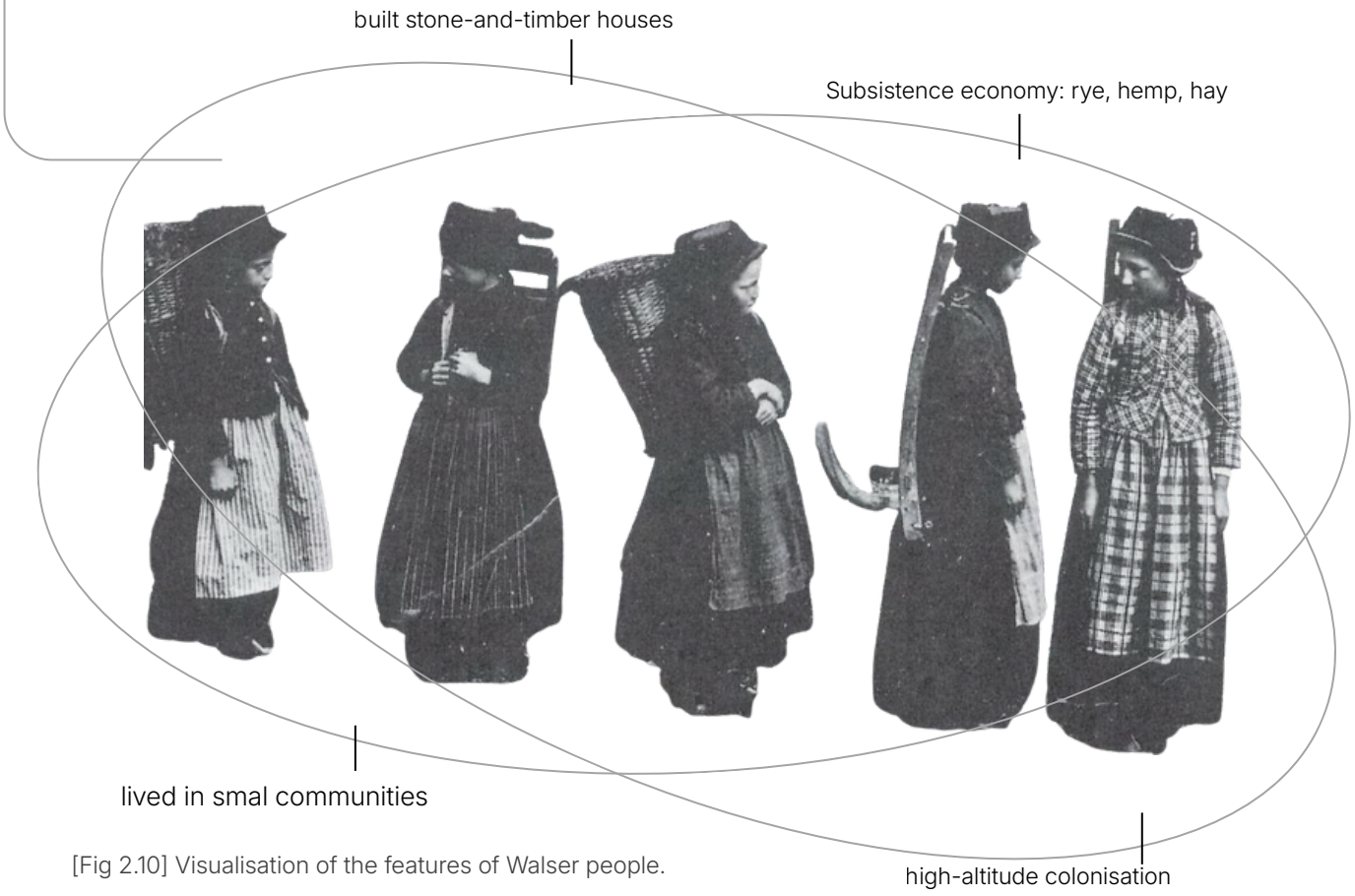
The pattern matters for this thesis in two specific ways. First, it places Pedemonte within a network of surviving examples across four countries, so the case study can be read as one instance of a wider condition rather than as a purely local one. Second, it poses at continental scale the question this thesis asks at the scale of a hamlet. What decides whether a Walser house endures? Section 2.1 has answered that across Europe, and the answer was institutional rather than physical. Chapter 3 asks the same question of eight buildings standing within a few hundred metres of one another, where the institutional answer is available for some and not for others.

2.2 The Walser of Alagna and Pedemonte

2.2.1 The Walser of Alagna

The last section showed where Walser architecture survives across Europe today. This section narrows to the single community whose houses this thesis studies: the Walser of Alagna Valsesia, on the southern side of Monte Rosa, and the small hamlet of Pedemonte within it.

The Walser are a German-speaking people who originated in the Upper Valais, on the northern side of Monte Rosa. From the twelfth and thirteenth centuries onward, groups of settlers crossed the high alpine passes to reach the upper reaches of the valleys on the southern and eastern side of the massif (Stainer & Farinetti, n.d.). At the time, these crossings were possible because many of the passes, such as the Colle del Teodulo, the Monte Moro, the Colle del Felik, and the Colle del Lys, were still free of permanent ice. The mountains that today appear as a barrier were in fact a crossroads (Guida Turistica Aosta, n.d.).

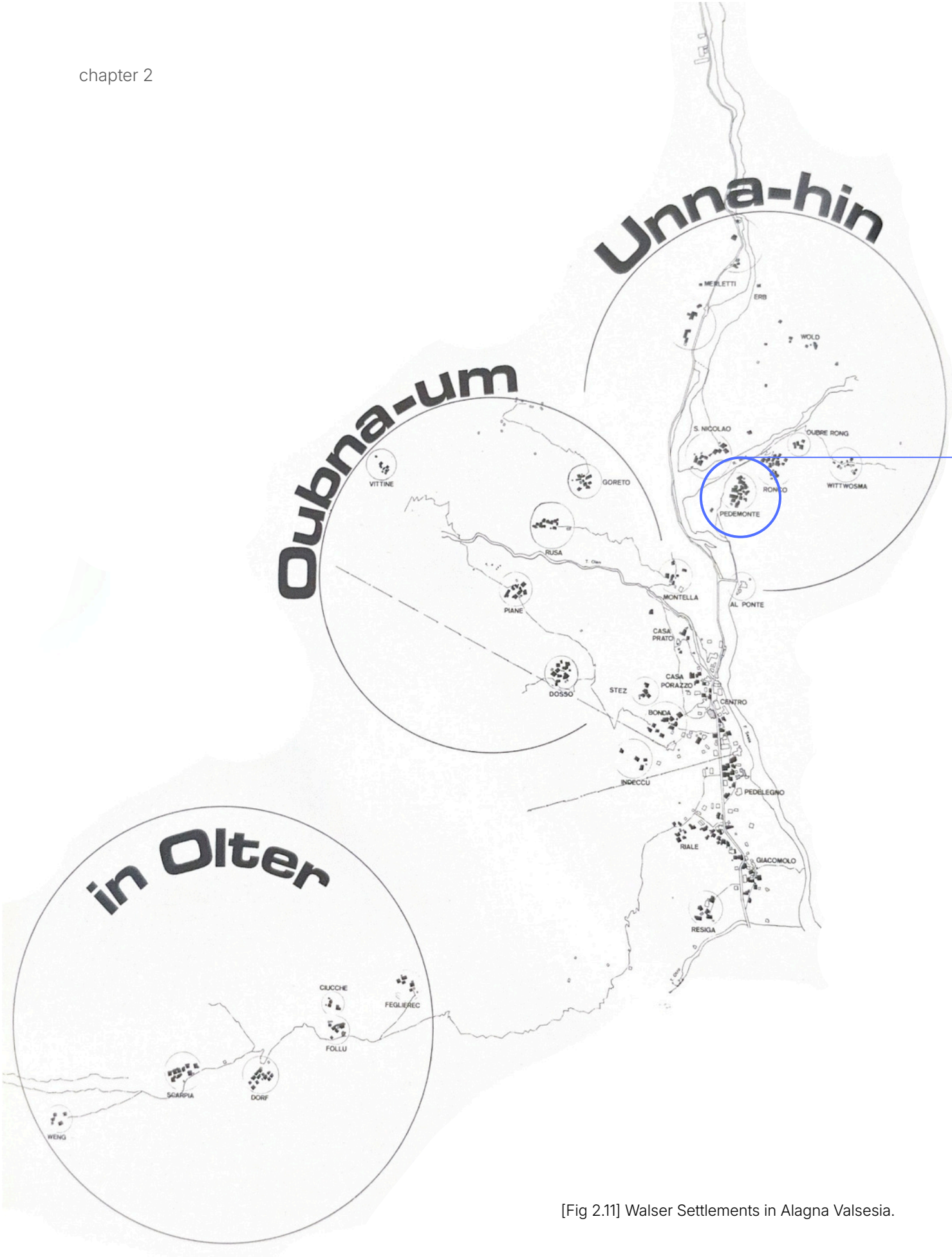


[Fig 2.10] Visualisation of the features of Walser people.

The settlers took up land at the heads of valleys that had been considered too high and too harsh for earlier inhabitants. In exchange for opening these lands they gained an unusual degree of freedom from the feudal obligations binding the valleys below (Stainer & Farinetti, n.d.). That freedom, combined with the isolation of the high valleys, is one reason the community was able to develop and hold its own language, customs and building tradition across centuries.

Within this wider Walser world, Alagna Valsesia is one of the colonies on the Piedmontese side of Monte Rosa, shown with its neighbouring settlements in Map 2.5. Alagna lies at the head of the Sesia valley, directly below the southern face of the massif, and it is one of a small group of Walser settlements in the Valsesia together with Rimella, Rima San Giuseppe, Riva Valdobbia and Carcoforo. Its position matters for two reasons. It sits high enough, at about 1,190 metres, to preserve the Alpine conditions the Walser house was built for. And it stands at the very end of the valley road, which for centuries limited outside contact and helped the community keep its distinctiveness.

That distinctiveness is still present. The community speaks titsch, a variant of the Alemannic dialect brought from the Valais and close to the archaic Swiss German still spoken in the homeland. It preserves its own place names, its own oral traditions and its own building type. That building type, the subject of this thesis, is the Walser house of Alagna, distinguished by the deep open gallery surrounding its timber core on three or four sides. The gallery and its climate work are examined in Section 2.3.



[Fig 2.11] Walser Settlements in Alagna Valsesia.

2.2.2 Pedemonte

Pedemonte, known in the Walser tongue as Z'Kantmud, is a small hamlet a few minutes' walk above the main settlement of Alagna, at about 1,200 metres (Stainer & Farinetti, n.d.). It is one of a ring of hamlets sitting above the town, each preserving a cluster of Walser houses around a central fountain or square. The hamlet is compact and can be walked through in a few minutes. About thirty historic buildings sit close together in a loose cluster, oriented broadly to the south, with a public fountain and a small open space at its centre, as Fig 2.11 shows. Around the buildings lie the mowed meadows that historically supported the household economy, and above the hamlet the slope rises toward the summer pastures. Pedemonte is reached on foot from Alagna along a short path, and by a narrow paved road from below. Its size and arrangement make it possible to see every building on a single visit and to compare their conditions directly.

Pedemonte is the case study of this thesis for three reasons.

First, it preserves a concentrated group of historic Walser houses. Construction dates are carved into ridge beams and doorways and run from the early sixteenth century onward, with dated examples including 1529, 1557 and 1596 alongside many later ones. This range makes the hamlet a compact record of the building tradition across almost five centuries. Second, Pedemonte holds the Walser Museum of Alagna, housed in a building of 1628 restored by the community to its original state as a working Walser house (Stainer & Farinetti, n.d.). The pattern set out at the end of Section 2.1, that Walser architecture survives where a community has organised itself to keep it visible, applies here directly and at close range. Pedemonte contains a museum-protected reference building standing among privately owned houses in daily use, which allows a direct comparison between a building exempt from the demands of modern habitation and buildings subject to them. Third, Pedemonte offers a coherent sample. The buildings stand close together, share a common orientation and belong to the same construction tradition. Climate exposure is therefore effectively constant across them, so differences between them can be read as differences in how each house has been treated rather than as differences of climate, site or building type. This is what makes the hamlet a test rather than an illustration, and Chapter 3 depends on it.





[Fig 2.12] Aerial views of the Pedemonte settlement in Alagna Valsesia. Photo by Jessica Casanova, 2026. Used with permission.

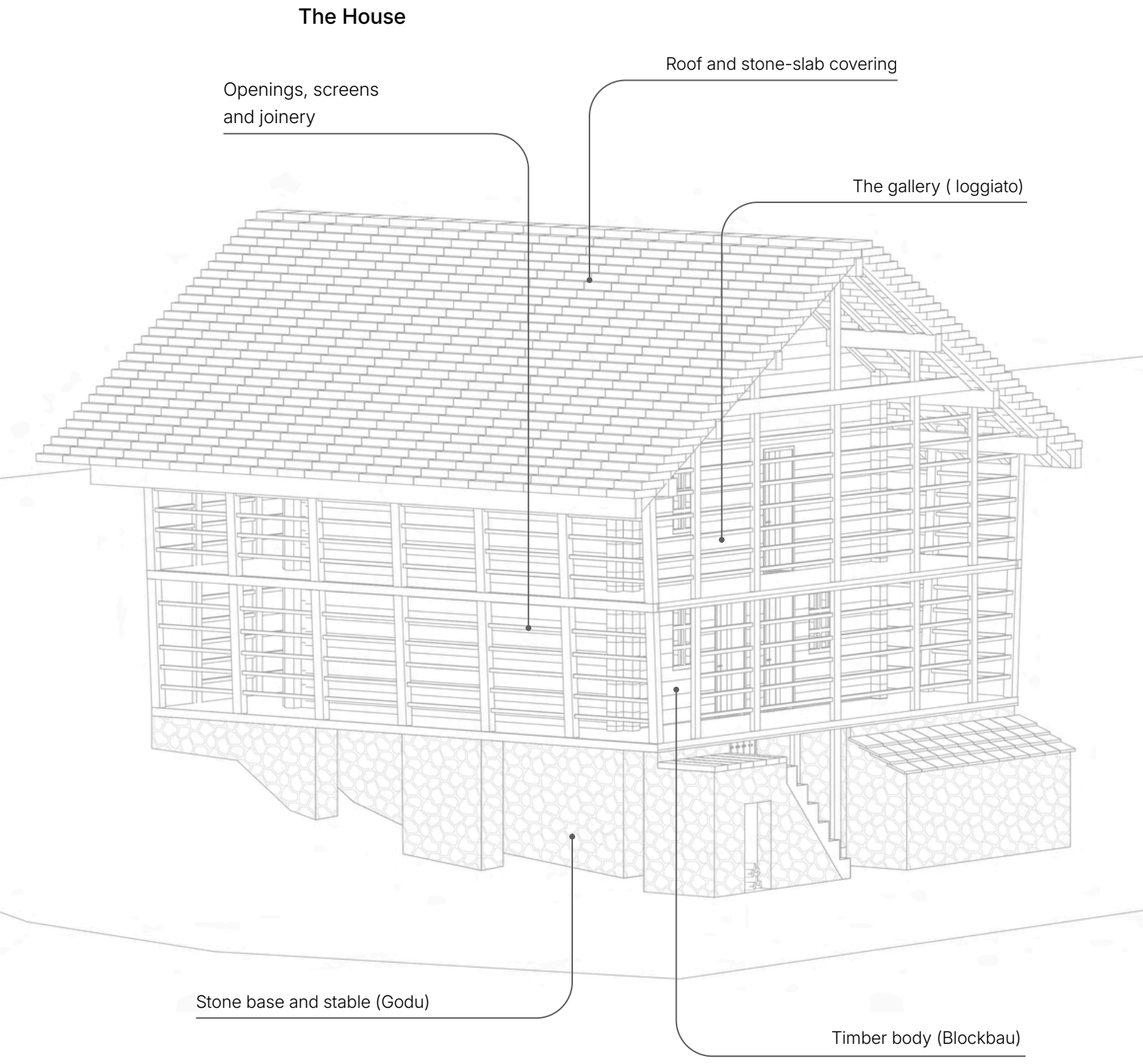
2.3 The house, element by element

Chapter 2 so far has placed Walser architecture in its wider European geography and narrowed to the community of Alagna and the hamlet of Pedemonte. This section turns from context to the object itself. It examines the Walser house element by element, in the order in which the house is built, from the stone base at the ground to the openings and screens that fill the walls.

For each element, four questions are asked:

- What is its original structural or protective function within the house?
- How much of the building's identity does it carry, so that its loss would be felt as a loss of the type itself?
- Which of the five mechanisms set out in Section 1.5 dominates its physical exposure, and is that mechanism intensifying?
- What do modern standards demand of it, from natural light and thermal comfort to safety codes and energy performance?

The last three questions are the three variables of the framework set out in Section 1.7, applied here to the building type rather than to individual buildings. Section 1.7 defined conflict as the coincidence of high significance, high vulnerability and tight regulation on the same element. Taking the elements one by one shows where that coincidence occurs, and prepares the survey in Chapter 3, which tests the result against eight buildings.



[Fig 2.13] Schematic 3D model (Revit) of a traditional Walser house, illustrating its primary architectural components.

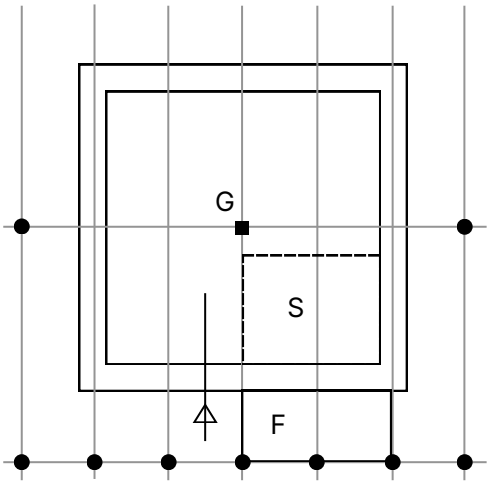
2.3.1 The house as a system

Before examining the Walser house element by element, this subsection sets out the whole building as a working structural system. Each of the five elements that follow, the stone base, the timber body, the gallery, the roof, and the openings and screens, does its own work, but each also depends on the others. The stone base carries the timber body; the timber body carries the roof; the roof shelters both the body and the gallery; the gallery uses the roof as its ceiling and the body as its inner wall. The house is not a stack of independent parts but a linked system, and reading it as such is what allows the element-by-element analysis in the subsections that follow to make sense.

Plan

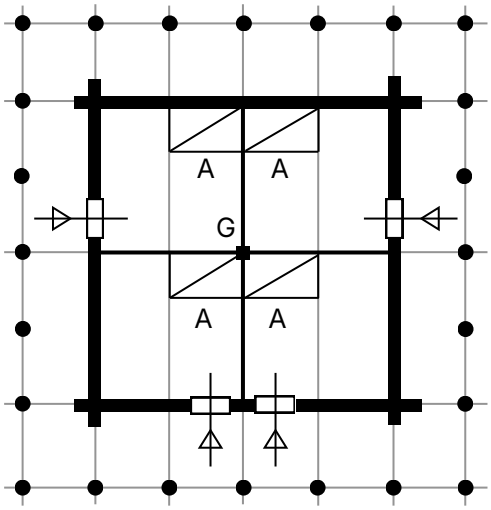
In plan, the Walser house is compact, typically between six and nine metres square, with the long side facing south. The stable and cellars occupy the ground floor in the stone base, entered from the outside through a low door. The dwelling occupies the middle floor above the stable, entered by an external stair that rises directly to the gallery. The upper floors, holding the hay loft and secondary rooms, are reached from the same gallery. The gallery therefore doubles as the primary circulation route of the house, giving access to every room above ground level from a single outside walkway. This arrangement, unusual in modern houses, was efficient in its own terms: no internal corridors were needed, and the interior volume could be divided into simple, rectangular, easily heated rooms. Schematic floor plans show the generic arrangement Daverio's census establishes for each level of the house. Plans F.0 – F.2 that follow the museum plates show how that arrangement is realised in one surviving example, the Walser Museum in Pedemonte, floor by floor in the same order.

0



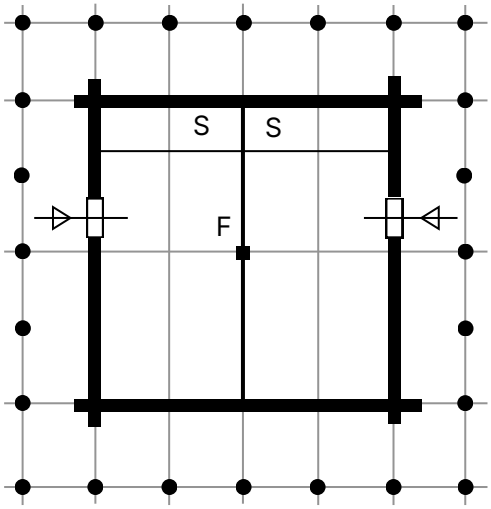
Schematic ground-floor plan of the semi-basement level of a typical Walser house in Alagna, after Daverio. The stable and the family sitting corner.
G = Godu (stable);
S = Stand (family sitting corner);
F = Firhus (kitchen).
Source: Daverio (1985), redrawn.

1



Schematic first-floor plan showing the four bedrooms above the stable. Access to each bedroom is from the external gallery (loggiato).
M = the "a misura d'uomo" module (roughly the diameter of the circle in Leonardo's Vitruvian man, applied here as the interval between the structural posts);
A = letto in alcova (bed in alcove, built into the room).
Source: Daverio (1985), redrawn.

2



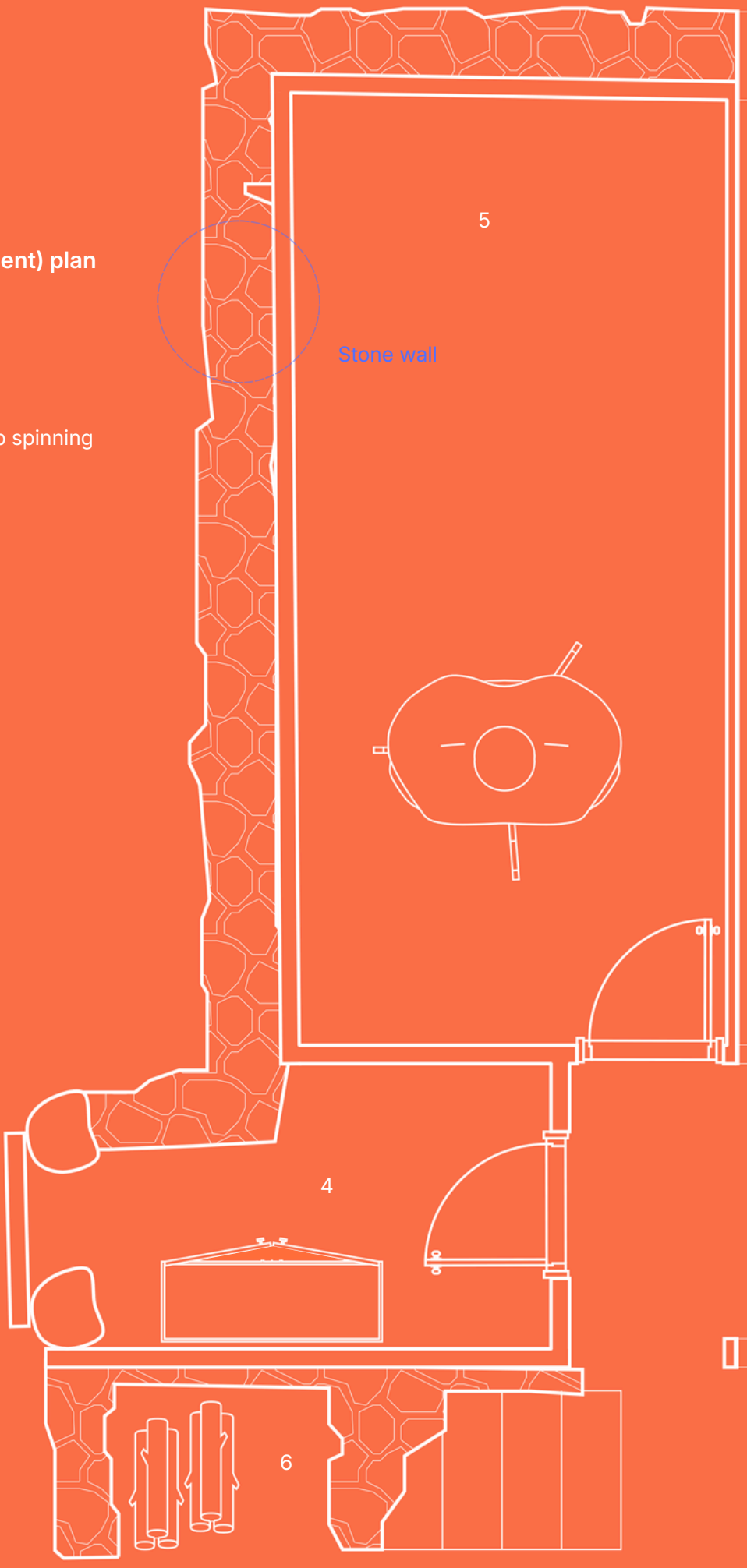
Schematic upper-floor plan showing the hay loft and food-storage level.
S = Spicher (grain and food store, a separate compartment within the loft); F = fienile (main hay loft).
Source: Daverio (1985), redrawn.

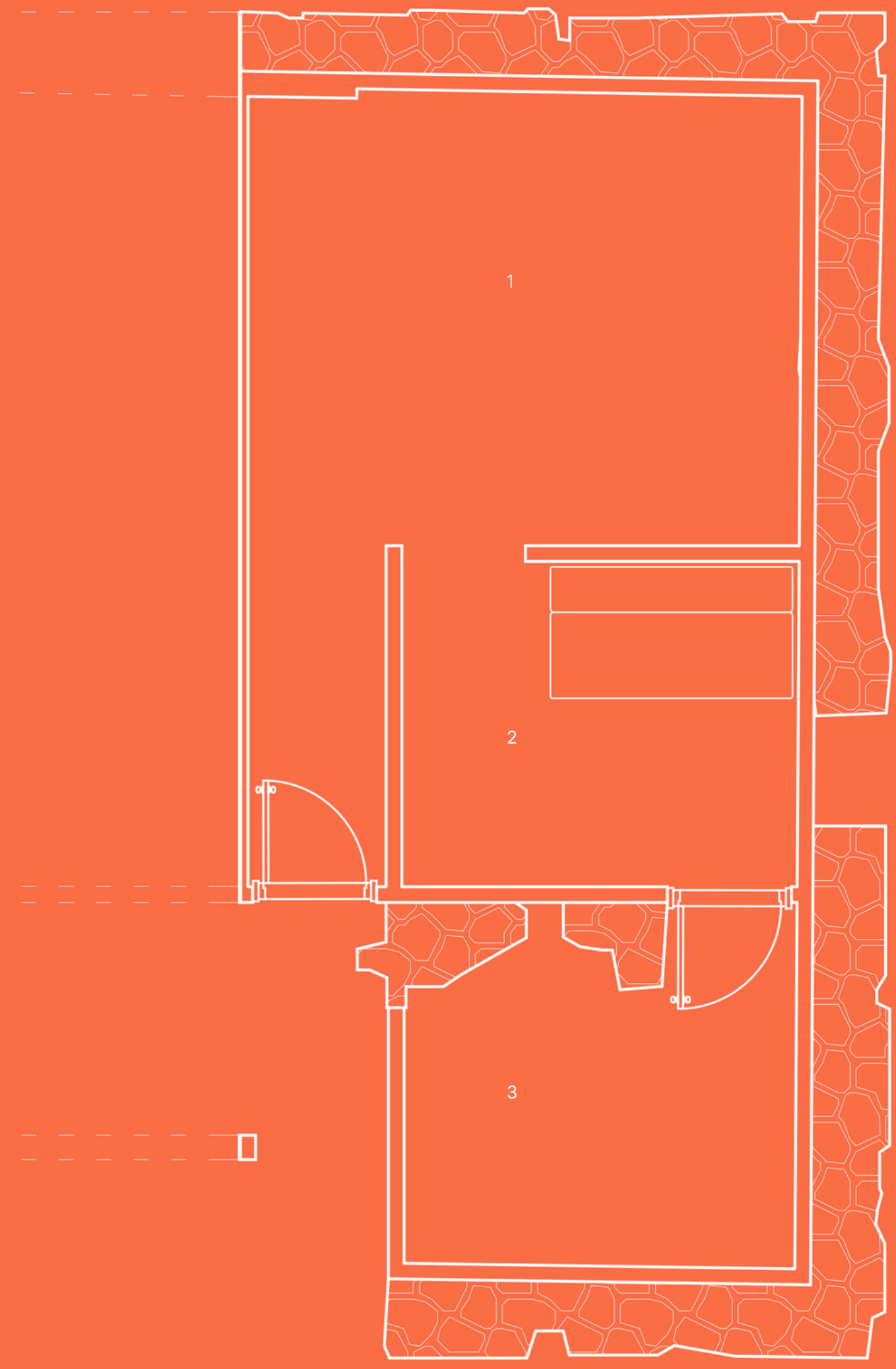
[Fig 2.14] Schematic floor plans of a typical Walser house in Alagna: semi-basement (stable and sitting corner), first floor (bedrooms), and upper floor (hay loft and storage). After Daverio (1985), redrawn by the author.

F.0

Stable floor (basement) plan

1 - Stable
2 - Living room
3 - Dairy
4 - KItchen
5 - Weaving and hemp spinning room
6 - Wood-store



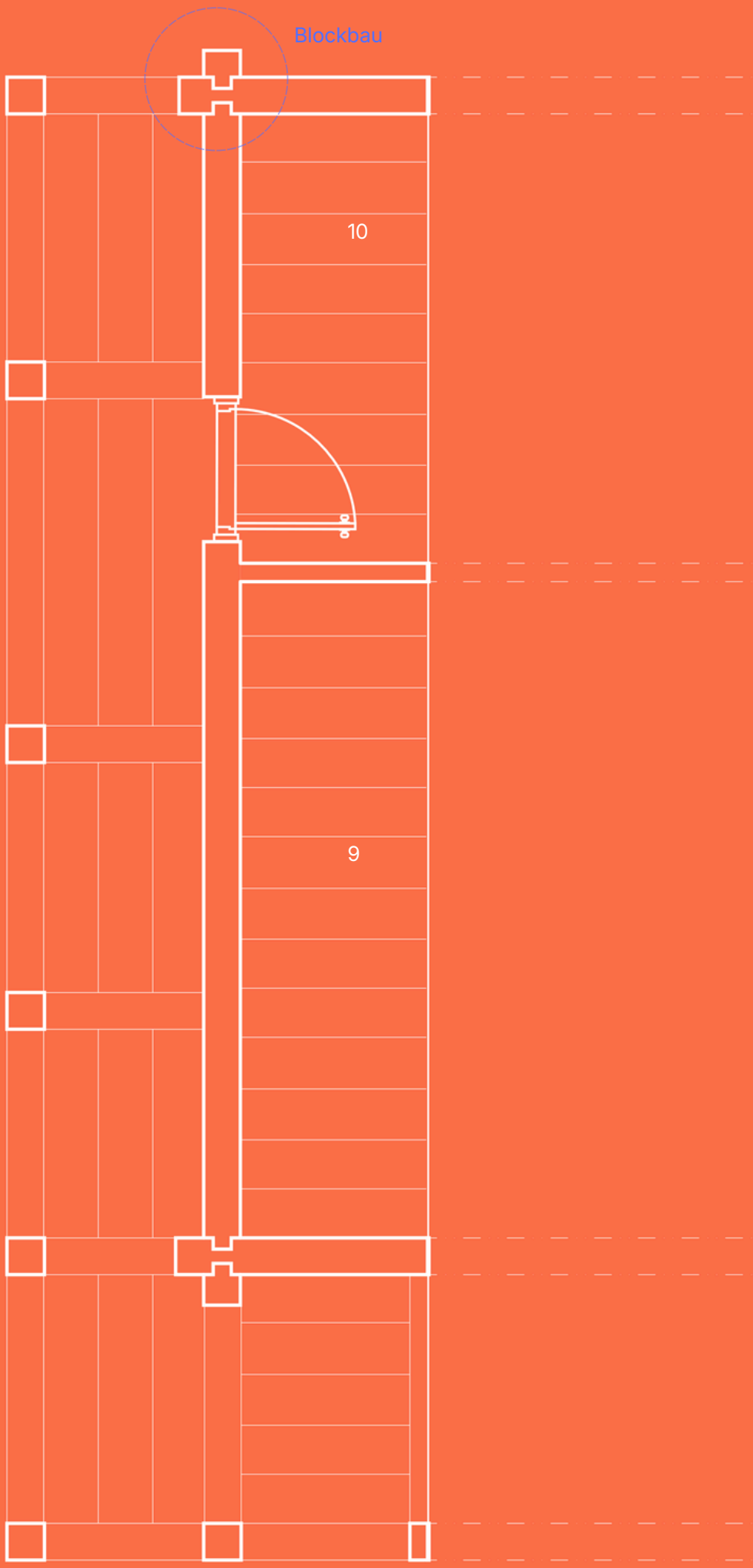

1
2
3

chapter 2

F.1

Bedroom floor plan

7 - Balcony
8 - Main bedroom
9 - Handicrafts room
10 - Tools room
11 - Archive and library

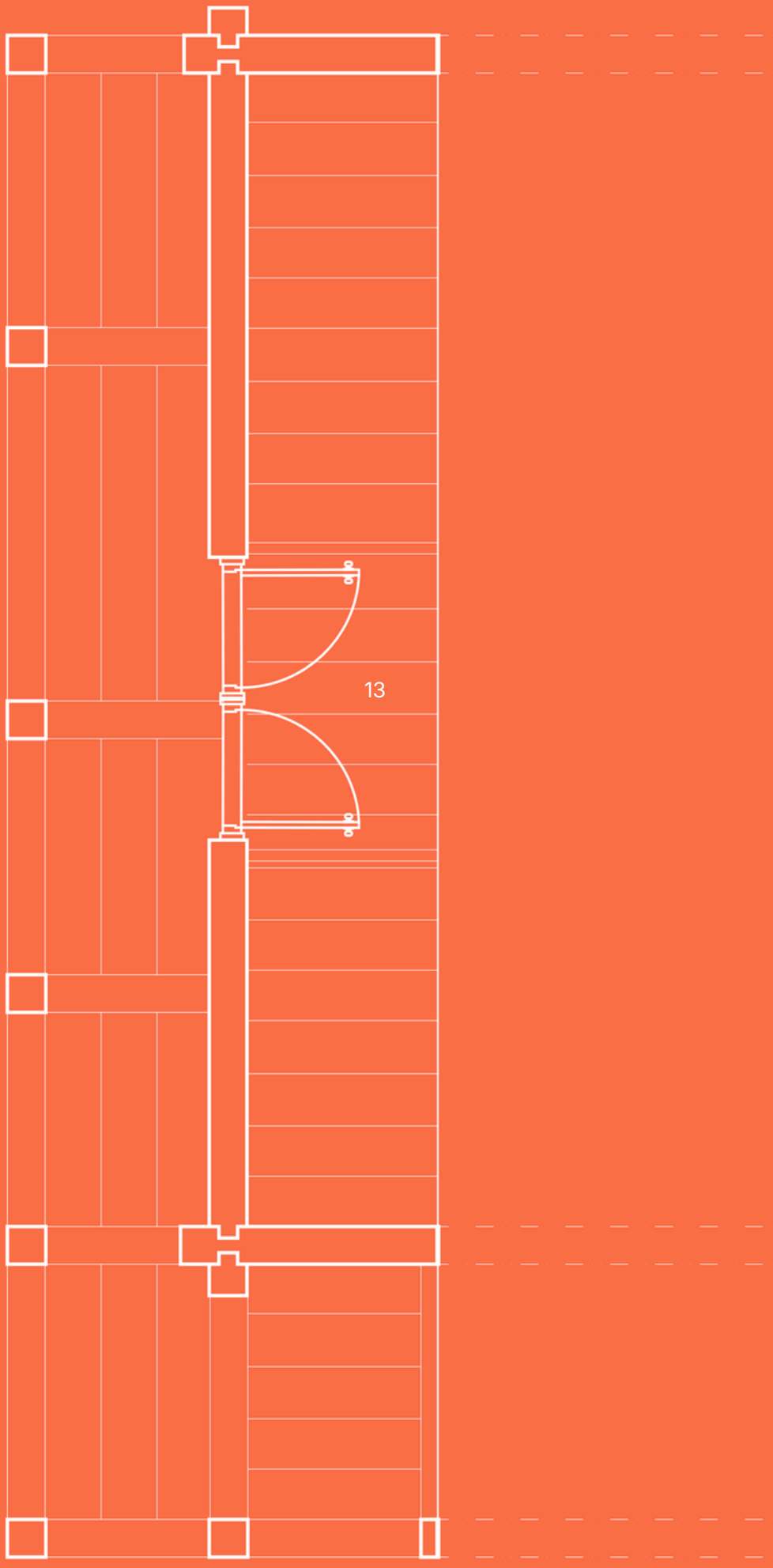


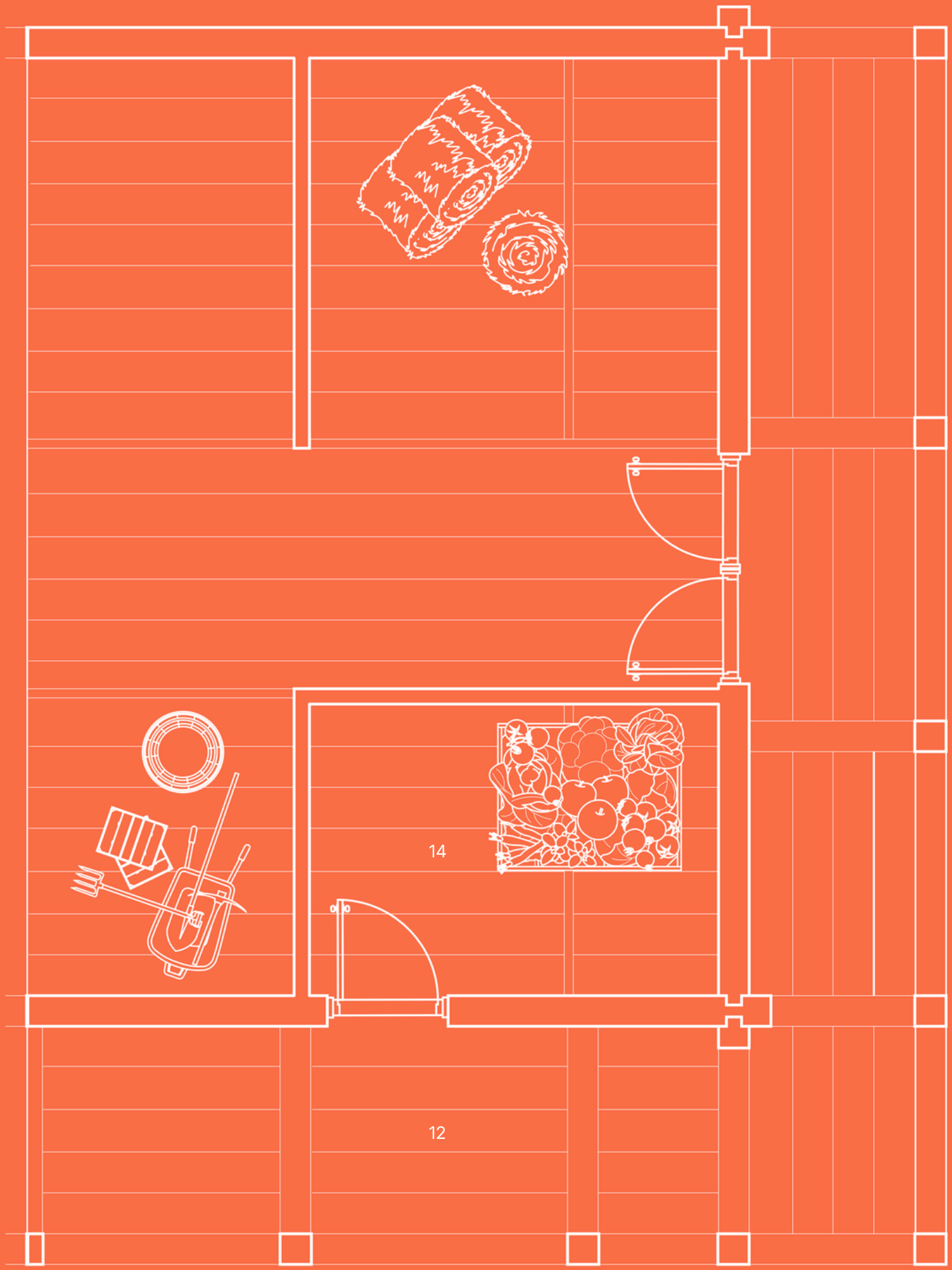

11
8
7

F.2

Barn floor plan

12 - Balcony
13 - Barn
14 - Food storeroom



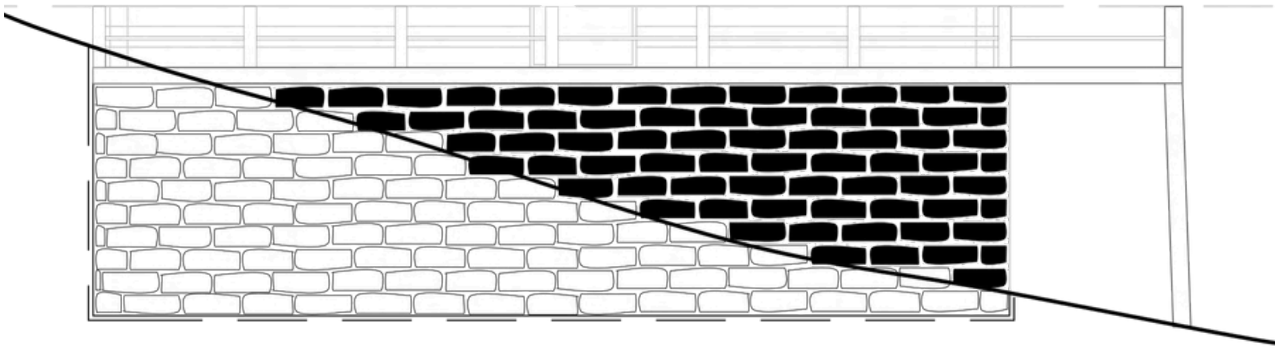

14
12

Section.
In section, the house stacks its functions vertically over three or four levels. At the ground, the stone base holds the stable and the cellars, with heavy walls half a metre or more thick. Above it, the timber body holds the dwelling on its lower level and the hay loft on its upper level, wrapped by the open gallery on the outside. Above them, the steeply pitched roof, covered with heavy stone slabs, projects a metre or more beyond the wall to shelter the gallery from wind-driven rain and direct snow. The vertical stacking of functions, animal below, human in the middle, crop above, is the defining spatial feature of the type. It is also a working thermal strategy: warm air from the stable rises into the dwelling floor, and the hay loft above the dwelling insulates the living quarters from the roof, while the projecting roof and gallery keep the exterior wall dry.

Loads and force paths.
Structurally, the house carries three kinds of load and moves them all through the same system. Vertical load, the weight of the roof, the stone slabs, the hay in the loft, the people, and the animals, is transferred downward through the timber body and the stone base to the ground. Snow load is added to this vertical stack during the winter and is carried by the same path. Lateral load, from wind and, to a small degree in this seismic zone, from occasional ground movement, is resisted by the same solid walls. The Blockbau wall does most of this work, because a stacked log wall is stiff both in its own plane and perpendicular to it, and the corners, where the logs interlock, act as effective moment connections. The stone base below and the roof above stabilise the whole system from top and bottom. The gallery, though it appears delicate, is structurally integrated with the roof and adds lateral bracing along the south side of the house, so its removal or enclosure changes the way the whole structure responds to wind and snow, not only the appearance of the façade.

2.3.2 Stone base and stable (Godu)

Function.
The stone base is the ground floor of the Walser house. It contains the stable, called Godu in the Walser dialect, together with cellars for tools, root crops and dairy work. The walls are built of local stone, roughly squared, and they are often more than half a metre thick, since this base carries the whole weight of the timber body and the roof above it. That weight is only the first of the demands placed on it. The base also anchors the building to a difficult site, because Alpine settlements stand on sloping ground, where a foundation has to work as a retaining wall as well as a bearing. It lifts the timber body clear of ground moisture, breaking the contact with wet earth that would otherwise cause fungal decay in the wood. And it holds the animals low in the section, so that their warmth rises through the floor into the dwelling above and reduces the fuel the household needs in winter. This last role is the one most easily overlooked, and it is the one that matters most for how the house was understood by the people who built it. The stone base is not simply a foundation. It is a working part of the building's climate strategy, and it uses living animals as a slow heat source through the cold months. That is also why its story changes so sharply once the animals leave, as the final part of this section describes.



[Fig 2.15] Masonry base details of the Walser house.



1



2



3

[Fig 2.16] A series of photographs focusing on the dry-stone masonry bases of traditional houses in Pedemonte.

Significance.
Significance, as used throughout this chapter, means how much of the building's identity an element carries. Measured that way, the stone base carries less than any other element examined here. A thick base of squared local stone standing under a timber structure appears throughout the Alpine arc, so a viewer reads it as Alpine rather than as specifically Walser. What is distinctive about the Walser base lies mostly inside it. The stable ceiling is low. The rooms follow a particular sequence of Godu, Stand and Firhus. There is no damp-proof layer of any kind between the wall and the ground. These features explain how the house worked, but none of them is visible from the street, and none of them is what makes the building recognisable. The consequence follows directly. Because altering the stone base costs very little identity, it has the widest margin for change of any element in the house. That margin is one reason the alterations recorded in Chapter 3 gather at exactly this level, and it is worth holding in mind through the two parts that follow.

Climate response.
Of the five mechanisms set out in Section 1.5, the one that dominates the stone base is freeze-thaw. Two conditions explain why. The base stands in direct contact with the ground, where moisture lasts longest, and it is built of masonry, the material most vulnerable to water expanding inside its pores. No other element in the house combines both, which is what makes the assignment unambiguous.
The direction of that mechanism, however, is not what such exposure would suggest. Section 1.5.3 established that freeze-thaw cycling at Pedemonte's elevation is projected to decline rather than rise (Blavier et al., 2025). Among the five mechanisms examined in this chapter, the one governing the stone base is therefore the only one that is easing.

Something else has changed in its place. Snow used to bank against the foot of the wall and hold it at a steady temperature through the winter, and that snowpack is thinning. The cycles that still occur now reach stone which used to be protected from them. So the number of cycles falls while the protection against them weakens, and the two movements roughly cancel each other out.

The material itself reinforces this reading, since stone is chemically stable, mechanically strong and largely indifferent to moderate temperature change. In the surveyed buildings the stone bases are usually the best-preserved element, still straight, still level, and still carrying the timber above without visible distress. Taken together, these observations make the stone base the clearest case in this chapter of an element whose physical situation is not deteriorating. Chapter 3 will nevertheless show it to be among the most consistently altered. Whatever explains that alteration, it is not the climate, and the next part sets out what does.

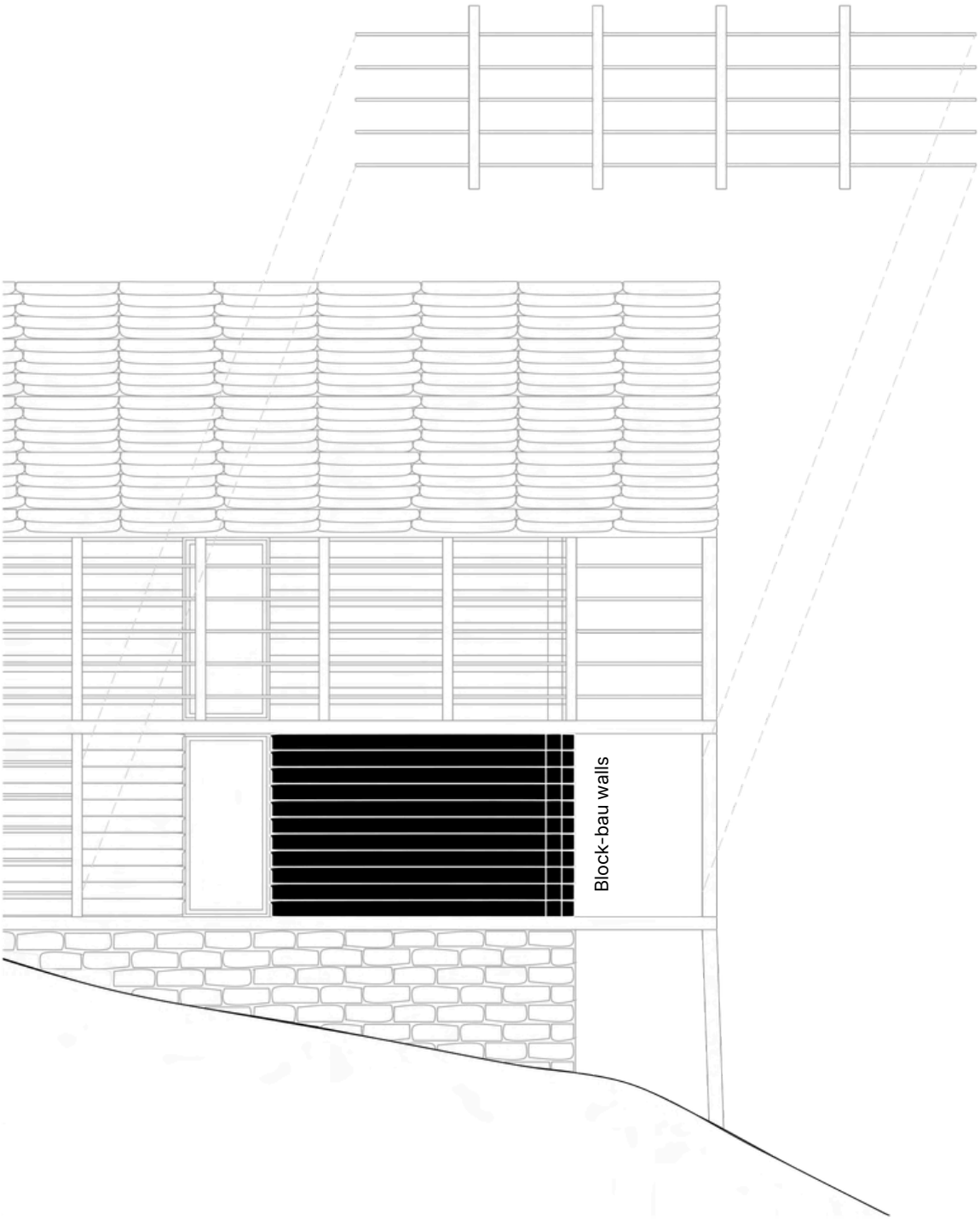
Modern-standards conflict.

The pressure on this element comes from an entirely different direction, and it begins with the animals. The stable was built for them, and its contribution to the house depended on their presence. In almost every private house in Pedemonte they are gone. The stable therefore heats nothing, and what remains is a large, cool, damp volume at ground level.

The most productive room in the house has become the most difficult one. It is too cold for storage and too damp to live in. It is also too dark, and too low, since the ceiling is usually well under two metres and animals never needed standing height. Faced with that room, an owner has three options. The stable can be left as an unused cellar. It can be converted to a garage or workshop. Or the ground can be excavated and the floor rebuilt to create habitable rooms.

The third is the most common, and it is also the most invasive. It usually means digging out the earth floor, pouring a concrete slab with insulation and a damp-proof membrane, and running modern services through the space, and it often means enlarging the small original openings for light and access as well. Each of these steps is defensible on habitability grounds. Each also removes part of the base's original character. And each undoes the moisture control that the traditional base achieved precisely by not being sealed at all. So the stone base is under real pressure, but not from the source the climate chapter would predict. It comes from what a modern household expects of a ground floor, and this is the pattern that Section 2.3.7 will show repeating across every element in the house.

2.3.3 Timber body (Blockbau)



[Fig 2.17] Schematic drawing of Walser house highligting the block-bau walls.

Function.
The timber body sits directly on the stone base, and it holds the dwelling together with the hay loft above it. It is built in Blockbau, or log-house construction, in which horizontal larch logs are stacked one on another and joined at the corners with interlocking notches. The technique is called Blockbau, and the wall it produces is the Blockwerk. The wood is Larix decidua, the European larch, chosen because it is dense, resinous and unusually durable outdoors. The logs are worked green and left to season in place, so that as they dry they lock into one another and tighten the whole wall. There is no separate structural frame, since the wall itself is the structure. Built this way, the timber body resolves several requirements at once. Structurally, it carries the roof and the hay loft without internal columns, which is what allows the rooms below to stay simple and rectangular. Thermally, a solid larch wall of fifteen to twenty centimetres holds heat by mass and carries the household through cold nights. Hygrically, larch handles the wetting and drying of an Alpine climate better than most softwoods, because its resin resists fungal attack and its density limits how much water it takes up. The corners are the weak point of the assembly, since the logs cross there and their end grain is exposed, and tradition protects them from above with wide roof overhangs and from below with the stone base. The timber body is therefore the second stage of the house's climate strategy: a warm, breathing, durable enclosure standing on a plinth that blocks the damp.

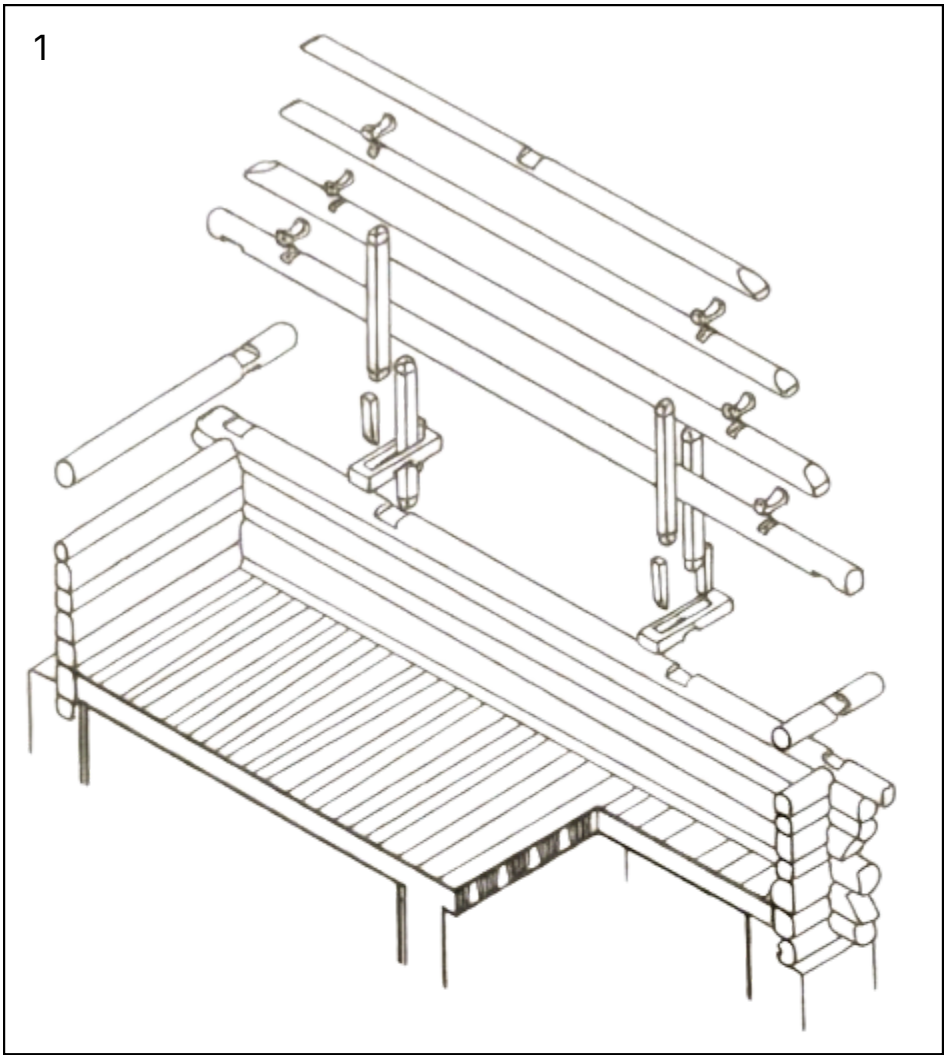
Significance.
If the stone base carries the least identity of any element, the timber body carries the material signature of the type. Stacked larch logs and interlocking corner notches are what a viewer identifies as Walser, once the gallery has drawn the eye, and the exposed grain of weathered larch is inseparable from how these buildings are understood and photographed. Its significance has one unusual property, however, and this separates it from the gallery.

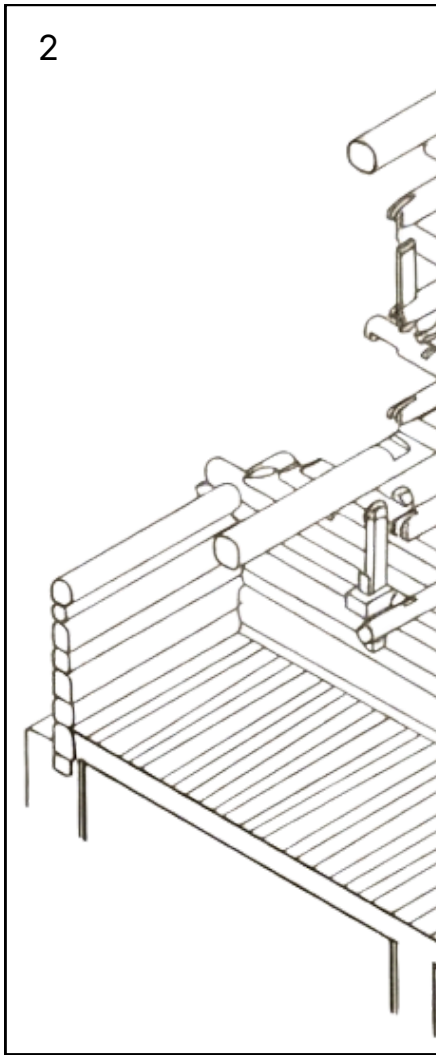
The Blockwerk can be concealed without being destroyed. Several houses in Pedemonte were plastered over their timber long before the period this study examines, and the wall survives intact under the render. Concealment is reversible in a way that removal is not, so the timber body can lose its visibility without losing its substance. Any assessment of this element therefore has to keep the two conditions apart, and Chapter 3 records them separately for that reason.

Climate response.
Of the five mechanisms set out in Section 1.5, the one that dominates the timber body is biological decay. Larch resists fungal attack better than most softwoods, but that resistance is conditional. It depends on a cold season long enough and hard enough to suppress fungal activity for most of the year.

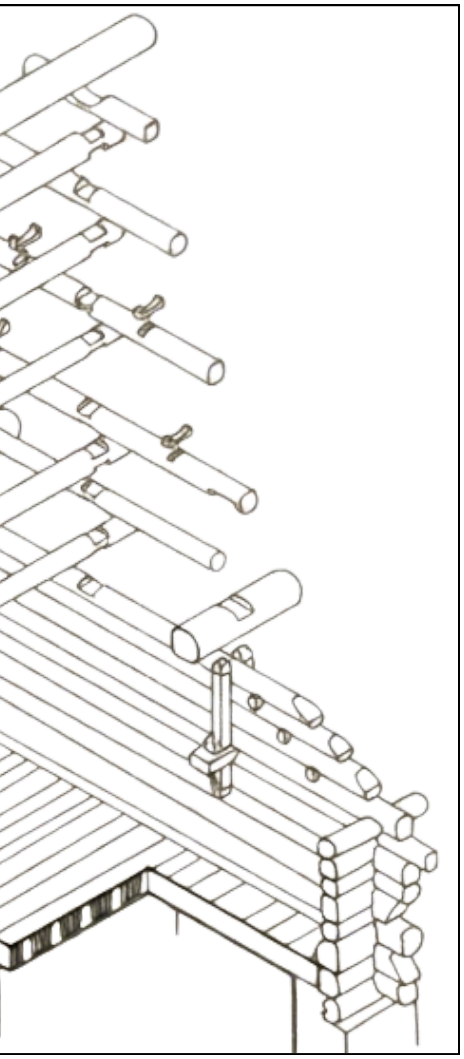
That condition is weakening. As the Alpine climate warms, the season during which decay fungi stay active lengthens at both ends (Curling & Ormondroyd, 2020; Grøntoft, 2019), and projections for the Italian Alps show rising growing degree days, which indicates more activity among the temperature-dependent insects that attack structural timber (Blavier et al., 2025). Since the Blockbau wall is the largest single mass of timber in the house, this slow pressure lands here more heavily than anywhere else in the building. Two findings from Section 1.5.4 give this its proper weight. Biological decay is the one mechanism where Alpine evidence shows clear and substantial worsening. And the Alps have until now been among the lowest decay-hazard environments in Europe. Taken together, they mean that what is happening to the timber body is the withdrawal of an old protection rather than the arrival of a new threat.

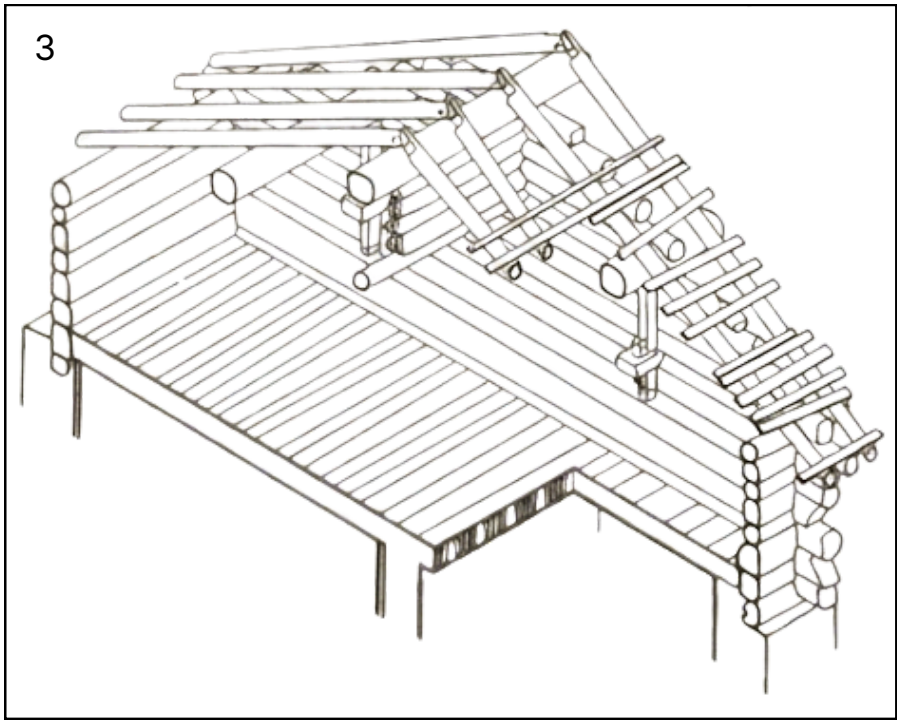
Resistance is not immunity, though, and the vulnerable parts remain what they have always been: the corners, the log ends, and any detail where water can lodge. These are exactly the points a traditional Walser carpenter protected, with generous overhangs, careful jointing and lime-based patch repairs. Where that maintenance has continued, the timber body has lasted five centuries without serious trouble, and the lengthening decay season is a real pressure but not yet a decisive one. Where maintenance has lapsed, decay moves much faster than the climate mechanism alone would predict, and the same happens where later repairs have introduced non-traditional materials such as cement mortars, non-breathable sealants, or ordinary framing timber in place of larch. *The fate of this element therefore depends less on the length of the decay season than on whether anyone is still doing the work that has always contained it. That dependence on the owner is the pattern the whole chapter converges on.*





[Fig 2.18] Blockbau construction process diagram.




3



[Fig 2.19] Blockbau, or log-house construction

Modern-standards conflict.
The tension here is unusually sharp, because the two systems work from opposite principles. *A Blockbau wall is designed to breathe,* letting small amounts of moisture pass in both directions, and its performance depends on that permeability. *A modern envelope is designed to be sealed, using continuous insulation, vapour barriers and airtight junctions to control heat loss and prevent condensation inside the wall.*

Italian energy performance rules set U-values that a solid larch wall cannot meet on its own (D.Lgs. 192/2005 and its successor decrees). A route around this requirement does exist, but only for buildings individually recognised as cultural heritage under Part II of D.Lgs. 42/2004, and only where the heritage authority agrees that compliance would seriously damage the building's historic character. The private houses of Pedemonte carry no such individual protection. What protects them is the Piano Paesaggistico Regionale, which governs the appearance of the historic nucleus as a whole. Their owners therefore have no legal way around the U-value requirement. Where a deep energy retrofit goes ahead, insulation has to be added to the timber body in some way.

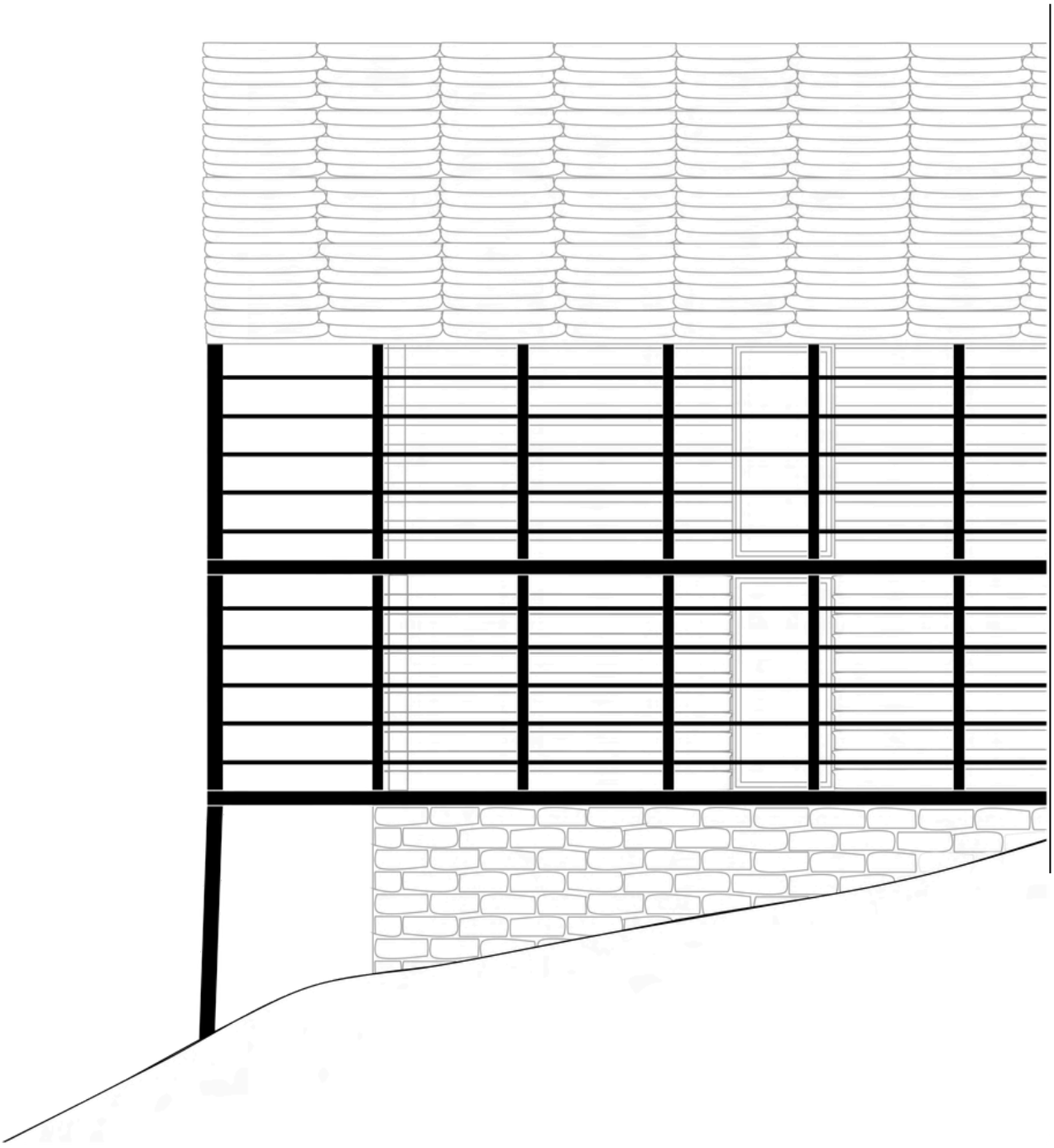
Thermal performance is not the only demand placed on this element. Fire regulations increasingly require internal linings that a solid timber wall does not have. Structural codes require certified calculations that historic timber walls rarely possess, and Alagna, though in a low-seismicity zone, is not exempt from checks. Wiring, plumbing and ventilation have to pass through walls built with no provision for any of them. None of this makes alteration inevitable, and many surveyed buildings still show substantial original Blockbau. But *when an owner does decide to modernise, the timber body is where the choices become hardest, because the compromise between authenticity and habitability is sharpest here.*

2.3.4 The gallery (Schopf / loggiato)

The gallery is a deep, open, timber-framed walkway that wraps the timber body on three or four sides at the upper levels. In the Walser dialect it is called Schopf, and in Italian loggiato. It is not a balcony added to the outside of the house but a structural extension of the roof, as Section 2.3.1 has already indicated. The roof overhangs the timber body by a metre or more, and the gallery fills the space between the wall and the eaves. The same larch columns carry the outer edge of the roof and the gallery below it, and the gallery floor is made of timber planks laid on joists projecting from the Blockbau wall.

The gallery was built to dry the harvest. In the Walser subsistence economy, rye, hemp and hay had to be dried in open air before they could be stored for the winter, and while they dried they had to be protected from rain, from birds and from rot. The gallery answered all of these requirements together. Its position answered the first. Set high on the house and wrapped around several sides, some part of the gallery was always exposed to sun and wind, whatever the hour, so drying could continue whenever the weather allowed. The deep overhang answered the second, keeping the crop dry when it rained. The open sides answered the third, letting air move freely, which is what makes air-drying possible at all. And the fine timber screens, the grigliati, treated separately in Section 2.3.6, kept birds and small animals out while letting the air pass through.

The gallery is therefore not decoration, and it is not simply circulation either, although it does give access to the upper storeys. It is a working climate device, built to complete the agricultural year, and everything that follows depends on that fact.



[Fig 2.20] Schematic drawing of Walser house highligting the Gallery.





[Fig 2.21] Gallery of Walser houses in Pedemonte. (Source: Author)

Significance.
The gallery carries more of the building's identity than any other element, and it carries that identity alone. A Walser house is recognised as Walser, from a distance, mainly because of the deep timber gallery wrapping its upper storeys. It is what a visitor sees first, what a photograph frames, what a tourist board reproduces, and what a heritage designation names. No other element does this work, and the comparison makes the point. A house that lost its grigliati or its stone slabs would still be read as Walser. A house whose gallery had been enclosed in glass would not. This is why the gallery, alone among the five elements, is the subject of a paradox rather than simply of a pressure. The two parts that follow set out its halves.

Climate response.
The gallery has changed along two axes at once, one physical and one functional, and the two point in opposite directions. Physically, the mechanism that dominates the gallery is thermal stress, which distinguishes it from the timber body it wraps. The stone base is buffered by the ground behind it and the Blockbau wall by its own mass, whereas the gallery has neither advantage. It is thin, open and exposed on most sides, with no wall behind it to absorb heat slowly, and its members are light enough to warm and cool quickly with the sun and the surrounding air. Section 1.5.1 established that a surface exposed on all sides at altitude passes through a wide daily swing even where the mean temperature is low, and the gallery registers that swing directly, in the steady loosening of its joints and the fine cracking of its most exposed members. Its openness adds a second exposure on top of the first. The outer edge sits directly under the eaves and takes wind-driven rain from every direction, the floor collects meltwater and runoff, and the columns stand wet for longer after each event than the sheltered timber body does. What has kept the gallery standing against all of this is maintenance. Individual damaged members were replaced, tar coatings renewed, and water drained carefully from the roof above, and five centuries of that work lie behind the galleries still in place. Where the work has continued, the gallery still functions as a structure. Where it has lapsed, decay is often visible in the gallery before it appears anywhere else in the house.

Functionally, however, the change has been far sharper than anything physical. The crops the gallery was built to dry, rye, hemp and hay, are almost no longer grown in Pedemonte, since tourism, part-time farming and small-scale specialised production have replaced the subsistence economy over the past century.

The gallery still stands, still spans, still gives access and still carries its share of the roof load. Its central purpose applies to no household. It is a working climate device whose climate work is finished.

The paradox: identity kept, function lost.

This is where the two layers come apart, and it is the point on which the argument of this thesis turns. *The gallery is the most identity-defining element of the Walser house, and it is also the element whose original function has disappeared most completely. It has kept its identity and lost its purpose.*

The consequences are worked out in the rest of the thesis, but they can be stated here. Because *the gallery most defines the house as Walser, it is also the element most closely watched by conservation regulation.* The Codice dei beni culturali e del paesaggio (D.Lgs. 42/2004) and the Piedmontese Piano Paesaggistico Regionale both treat the visible timber galleries of these houses as protected characteristic elements, and their enclosure or removal is subject to landscape permitting (Regione Piemonte, n.d.; Corte Costituzionale, 2024).

At the same time, and precisely because the gallery no longer serves its original function, the owner who lives in the house sees no reason to keep an open, unheated, unused timber walkway outside a heated interior. Modern living wants the enclosed volume, the additional living space, and the thermal continuity that only glazing and insulation can provide. The result is a symmetrical deadlock. *Everything the owner needs the gallery to be, the regulation forbids. Everything the regulation preserves, the owner has no living use for.*

In the terms of Section 1.7, the gallery is the one element of the Walser house where high significance, real vulnerability and tight regulation all fall together, which is the definition of conflict that framework gave. That it should be the gallery is not a coincidence but a consequence, since the element that most defines the type attracts the most protection, while the element whose function has most completely lapsed gives its owner the least reason to accept that protection. Chapter 3 documents, building by building, how the surveyed houses have negotiated this collision, and Chapter 4 returns to the paradox to ask what adaptation can mean for an element that has kept its identity but lost its function.





[Fig 2.22] Function change in Gallery of Walser houses.
(Source: https://www.comune.alagnavalsesia.vc.it)

2.3.5 Roof and stone-slab covering (Blatte)

Function.
The roof is steeply pitched and covered with heavy stone slabs, the Blatte, laid in overlapping courses on a timber substructure of rafters and battens, and it projects a metre or more beyond the wall on every side. Each of these features does work. The pitch sheds snow and water. The slabs are heavy enough to hold themselves and the structure below against wind uplift, and their mass slows the movement of heat through the roof plane. The overhang shelters the gallery, keeps wind-driven rain off the Blockbau wall, and protects the exposed log ends at the corners.

The roof therefore protects three other elements besides itself, which is why its condition matters well beyond its own fabric, and why the modern-standards pressure described below reaches further than it first appears.

Significance.
Unlike the elements examined so far, the roof carries the identity of the type at settlement scale rather than at the scale of the individual house. The heavy stone slabs, the steep pitch and the deep overhang give Pedemonte the continuous grey roofscape that is the first thing visible on approach, and a single roof replaced with imitation slate is legible mainly against its neighbours. Significance here is therefore cumulative and shared, which has a regulatory consequence taken up below, since the Piano Paesaggistico Regionale protects the roofscape as a landscape feature rather than protecting any one roof as an object. The overhang carries a second kind of significance, because it cannot be separated from the gallery it shelters. A roof cut back to a modern eaves detail has not altered only the roof.





[Fig 2.23] Walser house roof details. (Source: Author)

Climate response.
Of the five mechanisms set out in Section 1.5, the one that dominates the roof is change in snow and wind loading, and here too the picture is less simple than it first appears.

Total winter snowfall in the Italian Alps is decreasing, and the Alps are losing snow days fastest below 2,000 metres, which is exactly the elevation band Pedemonte occupies (Matiu et al., 2021). On average, therefore, the roof carries less snow than it was designed for. Averages mislead in this case, however. The same warming that reduces total snowfall also produces more intense single events, in which large volumes of snow, or heavy wet snow at higher densities, fall in short periods, and in which rain falling onto an existing snowpack adds weight without adding depth. For structural safety, these peak loads matter more than seasonal totals (Beniston et al., 2018). The roof therefore faces a condition familiar to Alpine engineers: over-provided for the average winter it now receives, and under-provided for the peak. It is this uneven loading, arriving in irregular combinations, rather than any steady seasonal decline, that most directly threatens the structure. Modelling undertaken for the revision of the Eurocodes finds these changes uneven across sites and consequential for structures designed to earlier standards (Croce et al., 2018; Le Roux et al., 2020), and a Walser roof was designed to no standard at all.

Two further pressures act on the roof, though neither dominates it the way loading does. Freeze-thaw affects the stone slabs, which weather slowly by absorbing surface moisture that then freezes, although Section 1.5.3 established that the frequency of freeze-thaw cycling is projected to fall rather than rise at this elevation (Blavier et al., 2025). Well-quarried Piedmontese slate is in any case highly resistant to this stress, and where slabs do fail, the tradition of replacing individual pieces as they weather is exactly the right response, so this is a maintenance question rather than a structural one.

A third and quieter pressure sits in the timber substructure beneath the slabs, where the rafters and battens are protected from the weather directly but not from moisture finding a path through a failing slab, and where they face the same lengthening decay season described in Section 2.3.3. A roof that leaks in one place can quietly rot its substructure over several years before the failure becomes visible from below. Even so, the loading pressure above is sudden and structurally consequential, which is why it matters more for this element than the slower decay working underneath it.

Modern-standards conflict.

The traditional stone-slab roof carries very little thermal insulation, for the simple reason that it was never asked to carry any. The hay loft beneath it was unheated, and the roof plane was not part of the thermal envelope of the dwelling. That changes the moment an owner converts the loft into habitable rooms, because the roof then becomes an external wall and Italian energy rules apply to it in full. Insulating a stone-slab roof means lifting the slabs, building up an insulated deck, and relaying them, and many owners do not relay them, since the original slabs are heavy, fragile and expensive to handle and lighter substitutes are permitted in some circumstances.

Loft conversion brings further requirements the original roof was never designed to meet: minimum ceiling heights for habitable rooms, natural light ratios that force dormers or roof lights into an unbroken plane, and structural verification of a substructure that was originally sized by eye. The result is that the roof, physically the most durable element of the house, becomes one of the most frequently altered whenever a house is deeply renovated. The driver is not the weather acting on the roof. It is the decision to occupy the volume beneath it, and this is the same pattern the stone base showed at the opposite end of the building.

2.3.6 Openings, screens (grigliati) and joinery

Function.
The openings of a Walser house are small and deeply set. The windows are few in number and limited in area, and they sit within thick timber or stone reveals. The logic behind this is thermal, since a small opening loses less heat than a large one, and glass was both expensive and a poor insulator. Daylight was a secondary consideration in a household whose working hours were spent outdoors. The grigliati belong to a different order of element. They are fine lattices of thin larch battens fixed across the open sides of the gallery, and they keep birds and small animals away from the drying crop while letting air pass through freely. They also shade the crop from direct sun, which slows drying to a rate that does not crack the grain. The grigliati are therefore functional components of the drying system described in Section 2.3.4 rather than ornament, although the patterns in which they are set vary from house to house and from carpenter to carpenter.

Significance.
These elements carry more identity than their size suggests, and the grigliati carry more than any element except the gallery itself. The lattice of fine larch battens is what distinguishes a Walser gallery from any other Alpine timber balcony, and it is what a close photograph of these buildings almost always frames. High significance combined with small scale is the condition that decides everything below. The gallery is visible at a distance, and regulation watches it accordingly. The grigliati can be removed without the change registering from the road, and in many cases without any permit being required at all.





[Fig 2.24] Walser house openings and facade details.

Climate response.

Of the five mechanisms described in Chapter 1, the one that dominates the openings, screens, and joinery is moisture, and it dominates them for a reason distinct from why it dominates any other element: their scale. The grigliati are made of the narrowest members in the entire house, and small pieces of timber move through wet and dry states faster than large ones under the same conditions, so any climate pressure that acts on the timber body acts more quickly here. Section 1.5.2 showed that wind-driven rain loads the exposed edges of a wall far more heavily than its centre, and that this pattern intensifies as rainfall arrives in shorter, heavier bursts; when that rain enters the gallery, it wets the grigliati directly, and their small members reach saturation and return to dryness faster than any larger element in the house, completing more wetting-drying cycles per season and reaching the point of joint failure sooner. Rising average temperatures compound this by extending the season during which decay fungi remain active (Curling & Ormondroyd, 2020), which shortens the effective service life of exactly these fine members first. The joinery around the door and window frames of the stone base faces a related version of the same pressure, since it sits at the timber-stone junction, already a vulnerable detail, and is exposed to the same rising ground moisture affecting the base itself.

Thermal stress acts on the grigliati too, but less decisively: their scale means they move with temperature quickly, yet larch resists rot well enough that heat cycling alone rarely causes failure. It is the frequency of wetting and drying, amplified by their fine scale, that most consistently explains why these are the first details to fail. None of these pressures is severe in isolation. In combination, and across the decades over which climate change is projected to intensify, they mean the grigliati and the small joinery of a Walser house cannot be treated as maintenance-free. They need active care, and if they do not receive it, they are the first parts of the house to disappear.

Modern-standards conflict.
The conflict here is the most direct in the chapter, because Italian habitability rules address these elements by name. DM 5 luglio 1975 sets minimum ratios of window area to floor area for habitable rooms, and the small original openings of a Walser house do not meet them. Converting any room to habitable use therefore requires enlarging its windows, and the requirement is quantitative and non-negotiable. Energy rules add a second demand, since single glazing in a thin timber frame cannot approach current U-values, so frames are usually replaced rather than repaired.

The grigliati face no such requirement, and that is precisely their difficulty. They serve no function a modern household needs. They obstruct the light and the view from a gallery an owner may want to use as a terrace. They are small, cheap to remove, and easy to replace with a plain railing. Nothing compels their removal, and nothing effectively prevents it. The grigliati are therefore the element most likely to be lost silently: without a permit, without a record, and without anyone outside the household noticing, until the pattern has gone from the whole hamlet. That silence is what distinguishes their loss from the gallery's, and Section 2.3.7 returns to the distinction.

2.3.7 What the elements show together

Reading the five elements in sequence reveals a pattern, and that pattern is the central finding of this chapter.

Each element is dominated by a different mechanism. Freeze-thaw dominates the stone base, biological decay the timber body, thermal stress the gallery, snow and wind loading the roof, and moisture cycling the openings and screens. This one-to-one match is a choice of exposition rather than a discovery, naming a single dominant mechanism for each element is what makes the reading below possible. The functional differentiation itself, the fact that each element answers a distinct environmental demand, was established on its own terms in Sections 2.3.1 through 2.3.6, from what each element actually does rather than from how the mechanisms happen to be counted.

In nearly every case, however, the mechanism that dominates an element is not what threatens its survival.

The stone base is dominated by the one mechanism that is easing, and it remains the best-preserved element in the surveyed buildings, yet it is among the most consistently altered, because a private owner wants habitable space where a stable used to be. The timber body faces a lengthening decay season, but its long-term integrity depends far more on whether traditional maintenance continues. The gallery is under real thermal stress, but it is enclosed because a household wants year-round living space rather than an open unheated walkway. The roof faces sharper and less predictable loading, but it is more often rebuilt because converting the loft below triggers insulation and structural requirements the original roof was never designed to meet. The openings and screens decay fastest of all, their small scale compounding every mechanism acting on them, but they are removed because they serve no function a modern household needs.

The same shape recurs from element to element, and the stone base states it most clearly of all, since there the physical threat is not worsening at all and the element is altered anyway.

What decides whether an element survives intact is therefore not its exposure. It is whether a private owner, working within Italian habitability and energy codes, judges it worth keeping as it is. Climate change functions here as a trigger. It raises the cost of leaving an element unchanged, at the same moment that regulation and household need are already pulling in opposite directions over that same element. Setting significance beside this produces a second finding, and it shapes what Chapter 3 looks for. Significance is not distributed evenly across the five elements, and neither is regulatory attention. The gallery is high in both, so its alteration is contested, permitted or refused, and visible from the road. The grigliati are comparably high in significance and low in effective regulation, because they are small enough to alter without a permit and invisible at the distance from which these buildings are usually judged.

Two elements of similar importance therefore fail in opposite ways. The gallery is fought over. The screens simply disappear.

Conflict, as Section 1.7 defined it, requires high vulnerability, high significance and tight regulation to coincide on the same element, and on this reading only the gallery satisfies all three. That is the prediction Chapter 3 tests against eight buildings in Pedemonte, where climate exposure is effectively constant across the sample and the demand placed on each building is not.

The first two chapters built a hypothesis. They established that the Walser house is a climate-responsive form whose elements carry both environmental function and cultural identity, and that a changing climate threatens these elements unevenly, with the gallery identified as the point where vulnerability and significance converge most sharply. That reading, however, was drawn from the building type and from the literature. This chapter tests it against the houses of Pedemonte themselves. It does so by re-surveying a documented group of the hamlet's buildings and comparing their present condition with the record made by Arialdo Daverio, so that change can be read directly from the difference between the two surveys. The chapter then draws the results into a catalogue and a vulnerability matrix, and finally turns from the buildings to the forces that act on them, because what the survey records as change is produced not by climate alone but by regulation and by the choices of owners as well. The chapter is therefore both the evidential heart of the thesis and the point where its separate threads, physical, regulatory, and human, are brought together.

C.3

Survey and catalogue

3.1 Method

This chapter compares the condition of a group of Walser houses in Pedemonte at two points in time. The earlier record comes from the survey of Alagna's houses carried out by Arialdo Daverio in the late 1960s. His census documented the buildings of the hamlet one by one, tied to a numbered site plan, and noted for each house its construction date, the arrangement of its façade, the shape and depth of its galleries, and the changes it had already undergone by that time (Daverio, 1985). The later record is the author's own re-survey, carried out in 2026. Because both records describe the same identified buildings, the comparison works as a matched-pair study, in which each building serves as its own reference. Change is not inferred from broad averages or trends across the settlement. It is read directly from the difference between two records of the same house.

The sample

The buildings examined here are not the whole hamlet but a focused subset of those recorded by Daverio. The choice was purposive, meaning the buildings were selected to fit the aims of the study rather than picked at random, and three criteria guided the selection. The first is documentation. Each building had to be clearly identifiable in the Daverio record, so that its baseline condition was documented and its plan number certain. Without this the matched-pair comparison would not be possible. The second is accessibility. Each building had to be visible and photographable from public paths and streets. Some buildings in Daverio's record sit back within private courtyards, are blocked by later construction, or can only be seen from angles that do not permit useful comparison with the baseline, and these were not surveyed. The third is variety. The subset was chosen to include a full range of gallery conditions, from houses whose galleries appear substantially intact to houses whose galleries have been visibly altered, so that the whole spread of outcomes is captured rather than only the most or least changed cases. A focused and well-documented subset fits the aim of this thesis, which is to build a diagnostic catalogue and to test the reading of Chapter 2, rather than to produce a statistical survey of the entire settlement. The subset is intended as a foundation, and later work, by the author or by others, can extend the same instrument to the remaining buildings.

A sample built this way cannot be used to estimate how common each gallery condition is across Pedemonte as a whole, and the counts given in Section 3.3 should not be read that way. Choosing for variety already fixes the range of outcomes before any building is examined. What the design supports is a different kind of test.

Chapter 2 predicts, in advance of the survey, that conflict of the kind defined in Section 1.7 concentrates on the gallery and nowhere else. A sample built to include a genuine range of conditions gives that prediction a real chance to fail. Had any surveyed building shown conflict on an element other than the gallery, the prediction would not have survived contact with the evidence. None did.

The survey sheet

Each building was recorded on a standard sheet following the element order established in Chapter 2: the stone base, the timber body, the gallery, the roof, and the openings and screens. For every element the survey recorded four things: how the element is built and its present condition, whether its original climatic function is still active, what has been altered since the baseline, and how far the element still carries the building's architectural identity. Recording all five elements for every building, including those where nothing had changed, was a deliberate decision. A complete record allows any pattern that later emerges, such as the gallery being consistently more altered than the roof, to stand as a finding of the survey rather than as an assumption built into it.

The sheet also recorded two things about the building as a whole, and both are additions to what a conventional conservation survey would capture. The first is current use, distinguishing museum, hotel and restaurant, and private residence. This is included because Chapter 2 concluded that the survival of Walser architecture across Europe tracks institutional care rather than climate or age alone. If that finding holds at continental scale, it should also be visible within a single hamlet, where buildings of different uses face different pressures. Recording the use of each building allows the hypothesis to be tested at the case-study scale. The second is evidence of occupation. A conservation survey that records only fabric can establish that a building is intact without establishing whether anyone can live in it, and the distinction matters here. A house may be intact because it is carefully maintained, or intact because it has been abandoned and nothing has happened to it for forty years. These two conditions look similar in a photograph of a wall and mean opposite things for the future of the building.

The survey therefore recorded, for each house, whatever visible signs of daily use could be observed from public space: smoke or heating flues in use, laundry, planters, furniture or stored goods on the gallery, vehicles and cleared approaches, curtains, lighting, external meters and services, and the general state of upkeep of joinery, gutters and paths.

The evaluation framework

The survey does not evaluate buildings against a simple preservation-versus-alteration axis. That framing would treat any modification of a Walser house as a loss and would miss what a design-informed reading of vernacular architecture can offer. A modified building is not automatically worse than an intact one. The distinction that matters is between two kinds of alteration. Where an intervention improves the building's usability while leaving the original architectural logic visible, the intervention is legible and can be judged on its own terms. Where an intervention conceals or replaces that logic, the identity of the building is compromised. What matters is the character of the alteration, not the fact of it.

Applying that distinction requires criteria, since otherwise the judgement rests on taste. This survey asks two questions of any intervention. Does the original element remain physically present, or has it been removed? And is its form still readable from outside, or has it been obscured? An intervention that leaves the element present and legible is an adaptation. One that removes it, or hides it behind new material, is a loss, and the distinction does not depend on whether the new material is sympathetic. Enclosing a gallery in glass leaves the structure physically present while ending the openness that defines it, so this survey treats enclosure as a loss of identity rather than as an adaptation, however carefully it is detailed.

The evaluation therefore combines two axes. The first is condition, recorded on each sheet with a four-part code:

I	intact, in function
A	adapted, identity kept
F	function lost, form preserved
X	altered, identity at risk

[Fig 3.1] Building condititon codes.

The second is use and occupation, recorded as above. Crossing the two produces the five building-level outcomes used in Section 3.4:

- **Intact and visited.** The building remains close to its original state and is preserved for visit-based use.
- **Intact but unoccupied.** The building remains close to its original state and is no longer in daily use.
- **Adapted and inhabited.** The building has been modified for continued habitation and the original architectural logic remains visible.
- **Function lost, form preserved.** The original agricultural function has ended and the Walser form is still legible.
- **Adapted and identity lost.** The building has been modified to a point where the original architectural logic is no longer legible.

The point of crossing the two axes is that neither alone is sufficient. A building that scores well on condition and has no occupants is preserved rather than sustained. A building that is comfortably inhabited and has lost its screens is sustained rather than preserved. The interest of Pedemonte lies in which buildings manage both, and Section 3.4 examines that directly.

Physical evidence and legal inference

The sheet recorded, separately from the physical description, any visible sign of intervention, together with a cautious note on whether the work appeared consistent with conservation norms as a general category. This separation between physical evidence and legal inference is a deliberate methodological safeguard. The survey records what is visible on the building, which is a matter of fact. It does not claim that any particular intervention on any named building was unauthorised, since such a claim would be impossible to verify from outside observation and inappropriate to make about identifiable private owners. Where the survey notes that an intervention appears at odds with conservation norms, the note is kept at the level of the type of work. Discussion of the rules themselves, and of the gap between what they require and what has been done, is reserved for Section 3.5.

A related limitation applies to motive. No owner was interviewed for this study, and the survey has no access to why an intervention was made, only to what was done. Where the register or the analysis that follows describes a change as meeting a need, such as more light, more room, or easier maintenance, this is a declared inference from the physical evidence, consistent with the alteration observed, not a report of anything an owner said. Where the reasoning is stated with more confidence than that, it should be read as shorthand for this inference rather than as a claim about intention.

The photographic record and its limitations

The evidence for each building consists of the author's photographic record, made during the 2026 fieldwork and read against the Daverio plates and, where they exist, against the architectural drawings of the buildings. For each building the survey attempted to photograph from the same viewpoints as the baseline plates, so that the two records can be read as directly comparable pairs, and a consistent set of views was used across the sample: main façade, corner, ground detail, gallery detail.

Five limitations must be stated, since they shape what the register can and cannot claim.

First, access. Photographing buildings from public space is generally lawful in Italy, and this survey relied on that freedom. Interior access was not sought, since all but the museum buildings are privately owned and inhabited, so the survey documents each building's exterior only. Two further constraints applied. Where identifiable individuals appeared incidentally in a photograph, their faces were blurred, in line with data protection requirements governing personal images. Where a building carries individually protected status under the Codice dei beni culturali e del paesaggio, the reproduction of protected property is governed separately by that Code, and the survey's own photographic record has been treated accordingly. Every judgement in this chapter about interior condition, comfort or habitability is therefore an inference from external evidence and is marked as such.

Second, viewpoint. The Walser Museum's open-air paths and interpretive material, installed after Daverio's baseline, together with the active daily life of the hamlet, made it difficult to photograph some buildings from the vantage points the baseline used. Where the original viewpoint could not be occupied, an alternative was chosen and noted in the entry.

Third, the presence of residents. Pedemonte is inhabited, and photographing private houses from a public path is not always welcome. Where residents were present and the survey judged that continued photography would be intrusive, work at that building stopped, and the missing views are supplied by written description rather than by image. Those entries state which views are absent and why. Where people appear incidentally in the photographs, their faces are blurred.

Fourth, the baseline itself. The Daverio images are sometimes limited in resolution or angle, and the comparison can only work with what the historical record made available. Where the baseline is too partial to support a specific reading, this is stated in the register entry for the building concerned rather than resolved by assumption.

Fifth, the method cannot see change that happened before the baseline, so in locations already registered as altered buildings, the inspection shows the total loss to be lower than it actually is.

The comparison and the presentation

The comparison is qualitative rather than metric, and this follows from the nature of the baseline: the Daverio record is descriptive, not measured, so a comparison against it has to work at the same level. The aim is to establish the direction and character of change in each element rather than to quantify it. The results are presented in four stages, each with its own analytical purpose. Section 3.2 sets out a register of the surveyed buildings, their recorded condition, their current use and their occupation state. Section 3.3 focuses on how the galleries specifically have changed, since the gallery is the element on which the argument of Chapter 2 most turns. Section 3.4 draws the findings together in a vulnerability matrix that sets risk against significance and against what regulation permits, applying the framework of Section 1.7 to evidence rather than to the building type, and it places each surveyed building in one of the five outcomes above. Section 3.5 then turns from the changes themselves to the forces that drive them, and Section 3.6 closes with the chapter's findings.

3.2 The building register

This section presents the eight surveyed buildings of Pedemonte, each documented as a matched pair of records: the baseline established by Arialdo Daverio's census of Alagna's houses (Daverio, 1985), and the author's own re-survey carried out in 2026. The register makes visible, building by building, what has changed between the two records, and it places each building within the five outcomes set out in Section 3.1.

The sample covers three use categories. Two buildings are museums, Building 89, the Casa Museo Baravex, and Buildings 93-94, the Casa Museo Walser. One is a hotel and restaurant, Building 87. The remaining five are private residences: Buildings 88, 91-92, 95, 96 and 105. Figure 3.1 shows the position of each surveyed building, together with the Walser Museum's open-air path and the three institutional or commercial anchors of the hamlet: the museum itself, the church of Pedemonte, shown for spatial context but outside this survey, and the Hotel & Ristorante Montagna di Luce. The distribution of uses is uneven in a way that matters for the argument. Two buildings out of eight are exempt from the demands of modern habitation, and six are subject to them in full. This is the asymmetry described in Section 1.3 and observed at continental scale in Section 2.1, appearing here at the scale of a single hamlet, where the buildings on either side of it stand within a few metres of one another.

The eight buildings selected are those that could be observed and photographed to a consistent standard from public space. Other buildings in Daverio's record, less accessible or blocked by later construction, are not included in the survey but appear on the site plan for spatial context. Each register entry follows the same structure: the building's context, current use and occupation state; a summary of its baseline condition; a summary of its 2026 condition; an element-by-element table of observed changes; and its placement in one of the five outcomes established in Section 3.1. Where a view could not be obtained, whether because the baseline viewpoint is no longer available or because photography was discontinued out of respect for residents, the entry states what is missing and supplies a written description in its place. The entries follow in order of building number.



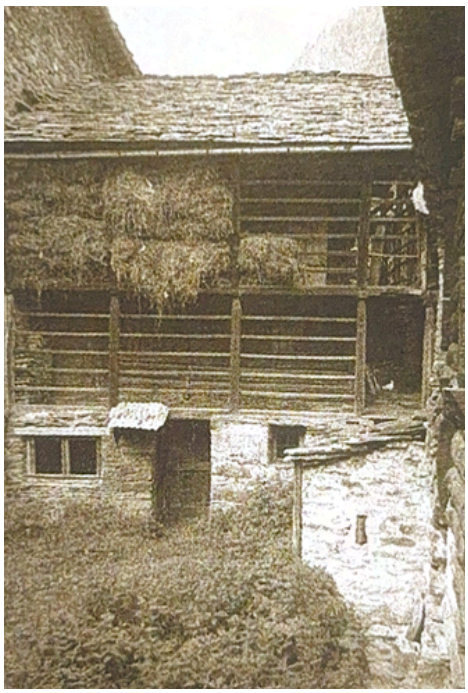
[Fig 3.2] Survey map. It was redrawn. Source: Alagna Valsesia, Censimento delle antiche case in legno - Arialdo Daverio

Survey Sheets

Selected Buildings

N.88

Use: **Private residence**
Evidence of occupancy: **Firewood in gallery, planters, maintained joinery**
Baseline survey: **Arialdo Daverio, 1969 (publ. 1985)**
Author's survey: **2026**



[Fig 3.3] Building N.88, Baseline condition, 1969. Source: Arialdo Daverio.



[Fig 3.4] Building N.88, Current condition, 2026. Photo by the author.

Status

- ☐ I intact / in function
- ☐ F function lost
- ■ A adapted, identity kept
- ☐ X altered — identity at risk

A - Survey

Element	2026
Stone base and stable	Masonry unchanged. Stable door and windows replaced with new elements following the original design. Entrance area landscaped: paved surface, seating, red-painted metal railings, and a new external staircase reaching the first-floor gallery from street level.
Timber body	Blockbau unchanged in form. Scattered members replaced during restoration; weathered original timber visible throughout.
Gallery	Open, unglazed, unenclosed. Posts appear original. Now used for firewood storage on the first floor, with service pipes from the working era still in place.
Roof and slabs	Unchanged. Deep overhang retained.
Openings and screens	Unchanged. Larch batten patterns intact at all gallery levels.

B - Outcome

Everything done to this building happened at the bottom. New doors and windows in the stone base, a paved entrance, seating, railings, a staircase up to the gallery. Above that level, nothing was touched. This is the pattern Chapter 2 predicts when a house can adapt without losing anything. The stable was genuinely dead, so it absorbed the change. The gallery is also dead, but you can still read it, so it was left alone. This matches the Gallery's general profile in Section 3.4 (high risk, high significance, tight regulation). The gallery no longer dries hay, but it does hold logs, and that small new use is enough to keep somebody walking on it and looking after it. It is the clearest case in the survey of an obsolete element surviving because it found something undemanding to do. One more thing sets this building apart. It carries a Casa Museo Daverio panel and stands beside the museum path, yet it is a private house and its owner must meet every habitability requirement that applies to the others. It gets the attention without the exemption.





[Fig 3.5] Building N.88, facade and gallery details, 2026.

Selected Buildings

N.93-94

Use: **Museum (Visited, not inhabited)**
Evidence of occupancy: **None. Visited, not inhabited. Maintenance performed institutionally.**
Baseline survey: **Arialdo Daverio, 1969 (publ. 1985)**
Author's survey: **2026**



[Fig 3.6] Building N.93-94, Baseline condition, 1969. Source: Arialdo Daverio.



[Fig 3.7] Building N.93-94, Current condition, 2026. Photo by the author.

Status

- [x] I — intact / in function
- [ ] A — adapted, identity kept
- [ ] F — function lost
- [ ] X — altered — identity at risk

A - Survey

Element	2026
Stone base and stable	Unchanged. Basement doors and windows are the original openings, unreplaced.
Timber body	Unchanged. Dense multi-level framing as recorded at baseline.
Gallery	Structure unchanged, unglazed, unenclosed. Empty of hay.
Roof and slabs	Unchanged. Stone slabs and deep overhang as at baseline.
Openings and screens	Unchanged. Larch batten patterns intact at all gallery levels.
Interior	Original period furnishings retained. Each room continues to represent its original function.

B - Outcome

Nothing had to be given up here, because nothing was asked of the building. This house is the best preserved in the hamlet, and it is easy to assume that means it was built better or looked after more carefully. Neither is true. It survives because it became a museum, and a museum does not have to satisfy the rules that apply to a home. No one sleeps here. No one heats it in January. So no requirement for light, insulation, ventilation or services was ever triggered, and no owner ever faced a choice between comfort and character. The interior makes the point exactly. Every room still holds its original furniture and still shows its original function, because showing how the Walser lived is what the building now does for a living. This is the reference against which the eight private houses should be read. Same slope, same weather, same snow. The difference is that somebody has to live in the others. Unlike the six inhabited buildings in this survey, maintenance here does not depend on a household finding a reason to keep the gallery in use (see Section 4.4).



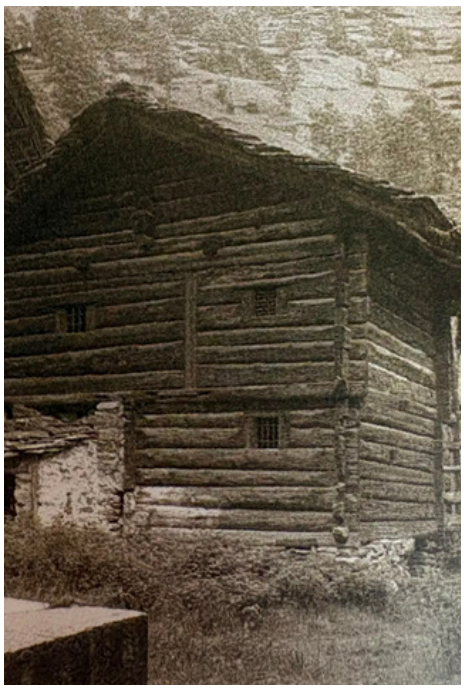


[Fig 3.8] Building N.93-94, facade and gallery details, 2026.

Selected Buildings

N.89

Use: **Museum (Visited, not inhabited)**
Evidence of occupancy: **None. Visited, not inhabited. Maintenance performed institutionally.**
Baseline survey: **Arialdo Daverio, 1969 (publ. 1985)**
Author's survey: **2026**



[Fig 3.9] Building N.89, Baseline condition, 1969. Source: Arialdo Daverio.



[Fig 3.10] Building N.89, Current condition, 2026. Photo by the author.

Status

- ☐ I intact / in function
- ☐ F function lost
- ■ A adapted, identity kept
- ☐ X altered — identity at risk

A - Survey

Element	2026
Stone base and stable	Masonry retained. Stable door and windows replaced in matching design. A projecting stone element on the left of the basement façade, function unidentifiable from the baseline plate, has gone. A window occupies its position and the surrounding masonry was kept rather than rebuilt. Entrance landscaped (paved surface, seating, red-painted metal railings, new external staircase to the first-floor gallery).
Timber body	Blockbau unchanged in form. Scattered members replaced during restoration.
Gallery	Open, unglazed, unenclosed. Posts appear original. Some members replaced.
Roof and slabs	Unchanged. Deep overhang retained.
Openings and screens	Unchanged at gallery levels.
Interior	Floor replaced with new material. New furniture introduced for museum presentation.

B - Outcome

This building was opened to the public, and its opening came at a cost. Its exterior was kept as close to the baseline as any building in the register, with one exception: a small section of the façade was demolished and rebuilt rather than repaired in kind. Below ground, the basement was converted into a small interactive exhibition space, a change the exterior-only survey in Section 3.1 cannot register directly. Its placement next to buildings 93-94 makes it convenient. Both are museums. Both are exempt from habitability regulations. Yet the two were not treated alike. Buildings 93-94 required neither change, because visitors experience them as a combined interior route entered through building 89. So even where the need for comfort disappears, the need for access remains, and it leaves its mark exactly where circulation runs.





[Fig 3.11] Building N.89, facade and gallery details, 2026.

Selected Buildings

N.96

Use: **Private residence**
Evidence of occupancy: **Curtains, items on the balcony.**
Baseline survey: **Arialdo Daverio, 1969 (publ. 1985)**
Author's survey: **2026**



[Fig 3.12] Building N.96, Baseline condition, 1969. Source: Arialdo Daverio.



[Fig 3.13] Building N.96, Current condition, 2026. Photo by the author.

Status

- ☐ I intact / in function
- ☐ A adapted, identity kept
- ☐ F function lost
- ☐ X altered — identity at risk

A - Survey

Element	2026
Stone base and stable	No change since baseline. Plastered in the baseline plate and plastered now.
Timber body	No change since baseline, but already rendered when Daverio recorded it. Plaster over Blockbau is not a Walser feature, so this loss predates the survey window and falls outside what the matched pair can measure. The timber survives beneath.
Gallery	Structure, posts and wraparound form retained. Grigliati absent at first floor, replaced by plain railings.
Roof and slabs	Three dormers inserted, attic converted to habitable rooms, new chimneys added.
Openings and screens	Removed at first floor. Condition at upper levels not assessable from the available photographs.

B - Outcome

The owner added rooms to the attic, and the lattice screen covering the first-floor gallery is gone. The two may not share a cause: dormers light the attic from the roof plane, one level above the gallery, so attic conversion alone does not explain why the screen below was removed. What matters are the unchanged aspects. The plastered base and plastered timber frame, the parts most exposed to frost and dampness, are exactly the same as they were initially. None of this was due to weathering. It was done by a household. The plaster deserves a second look, because the fact that there have been no changes since the beginning does not mean it hasn't changed. Applying plaster over the blockwork is not a characteristic of Walser, and covering the timber conceals the material that defines the house. This building had already lost that part of its character before Daverio photographed it. If a building that has already been altered from the beginning is shown, the inspection can only report that there is nothing more. The only consolation is that the plaster conceals the blockwork without destroying it; this, unlike the loss of the grids, is reversible.





[Fig 3.14] Building N.96, facade and gallery details, 2026. Photo by the author.

Selected Buildings

N.95

Use: **Private residence**
Evidence of occupancy: **Curtains, items on the balcony.**
Baseline survey: **Arialdo Daverio, 1969 (publ. 1985)**
Author's survey: **2026**



[Fig 3.15] Building N.95, Baseline condition, 1969. Source: Arialdo Daverio.



[Fig 3.16] Building N.95, Current condition, 2026. Photo by the author.

Status

- ☐ I intact / in function
- ☐ A adapted, identity kept
- ☐ F function lost
- ☐ X altered — identity at risk

A - Survey

Element	2026
Stone base and stable	Exposed stone masonry, unplastered. No change since baseline.
Timber body	Blockbau exposed throughout. No change since baseline.
Gallery	Open, unglazed, unenclosed overall. A section was already enclosed in the 1969 baseline photograph, predating the survey window; this pre-existing loss is not attributable to the pressures examined in this study, but it remains a loss under the openness test in Section 3.1.
Roof and slabs	No dormers on the visible pitch. No change observed.
Openings and screens	Grigliati present at all levels except the closed section. The added rails are fixed over the lattice rather than replacing it, and the batten pattern remains readable beneath.

B - Outcome

This house has been adapted without losing anything. Everything added to the gallery, planter rails, light fittings, conduit, is fixed over the original fabric rather than in place of it, so the grigliati are still there and the lattice can still be read. Under the test set out in Section 3.1, that is an adaptation and not a loss. The element remains present and remains legible. The comparison with Building 96 is the useful one, since the two houses faced the same question and answered it differently. Both owners wanted more from the gallery. In 96 the lattice came off so that new attic rooms could look out through it. In 95 the lattice stayed and things were hung on it. One owner removed the screen to gain light. The other kept the screen and gained a place for flowers. That difference is not explained by climate, by altitude, or by the age of the buildings, all of which the two houses share. It was a choice, and it is the clearest evidence in the register that identity loss in Pedemonte is optional rather than inevitable. One section was closed before this study began. The rest was kept open by choice, not by luck.

Selected Buildings

N.91-92

Use: **Private residence**
Evidence of occupancy: **Planters, items on the balcony.**
Baseline survey: **Arialdo Daverio, 1969 (publ. 1985)**
Author's survey: **2026**



[Fig 3.17] Building N.91-92, Baseline condition, 1969. Source: Arialdo Daverio.



[Fig 3.18] Building N.91-92, Current condition, 2026. Photo by the author.

Status

☐ I intact / in function
☐ F function lost
☐ A adapted, identity kept
■ X altered — identity at risk

A - Survey

Element	2026
Stone base and stable	Exposed masonry retained, whitewashed at the ground floor as in the baseline. Green-painted timber door fitted in the original opening. Forecourt now laid with stone paving.
Timber body	No change since baseline. Blockbau exposed throughout.
Gallery	Open, unglazed, unenclosed. Structure and posts retained at both levels; depth retained at the first floor. First-floor gallery floor and balustrade appear renewed. There are planters, seating and stored goods along the front as a trace of domestic use.
Roof and slabs	No change observed. Stone slabs and deep overhang retained.
Openings and screens	Grigliati retained at the first floor. Absent at ground floor, but the baseline photograph already shows this section closed, so the loss predates the survey window and falls outside what this study measures.

B - Outcome

The gallery here has now taken on a different purpose than simply drying goods. The baseline displays fabrics and products laid out on it. Today, it houses potted plants, chairs, and the mundane furnishings of a home. Nothing needed to be removed to make this possible on the first floor. The ground floor lost its screen before this study begins, so it cannot be counted as part of this building's story of adaptation, only noted as a pre-existing condition. Every piece that gives the house its identity remains in place. The wooden parts are exposed, the partitions are preserved on both levels, the roof remains unchanged, and the stone floor stays as it was. The additions are small and reversible: a new door to an old opening, paving laid in the courtyard, and a renovated gallery floor. The floor is noteworthy because it's the repair this research most wanted to find. The gallery floor is submerged in stagnant water and decays before other parts of the structure, so replacing it is more a form of maintenance than a change, and it ensures the survival of precisely this element. This building and building number 95 highlight the same point in different ways. Both owners wanted the gallery to be usable again. To achieve this, they removed nothing.

Selected Buildings

N.105

Use: **Private residence**
Evidence of occupancy: **Curtains, items on the balcony.**
Baseline survey: **Arialdo Daverio, 1969 (publ. 1985)**
Author's survey: **2026**



[Fig 3.19] Building N.105, Baseline condition, 1969. Source: Arialdo Daverio.



[Fig 3.20] Building N.105, Current condition, 2026. Photo by the author.

Status

- ☐ I intact / in function
- ☐ F function lost
- ■ A adapted, identity kept
- ☐ X altered — identity at risk

A - Survey

Element	2026
Stone base and stable	Exposed masonry retained. No change since baseline.
Timber body	Blockbau exposed throughout. Sound condition, where the baseline shows visible deterioration. Members appear to have been repaired or replaced in kind.
Gallery	Open, unglazed, unenclosed. Structure, posts and depth retained on both levels. Repaired since baseline. No enclosure and no infill.
Roof and slabs	Stone slabs and deep overhang retained. Condition improved since baseline.
Openings and screens	Grigliati retained across the gallery front, the batten pattern readable at both levels. First-floor window enlarged.

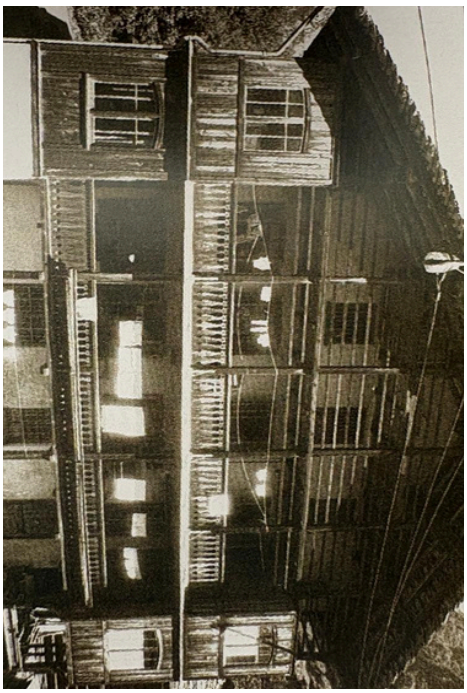
B - Outcome

The baseline shows a building in poor condition. The 2026 record shows the same building sound. Something was done here, and what was done was repair. The timber is still exposed, the galleries are still open on both levels, the screens are still in place, and the roof still carries its stone slabs. Nothing was removed to make the house work again. One window was enlarged, and that is the only alteration on an otherwise repaired building. This is the outcome the thesis has been looking for. Building 96 gained rooms and lost its screens. Building 87 gained a business and lost its galleries. This house was brought back into good order and lost almost nothing, because repair and alteration are not the same act even when both cost money and both require permission. The enlarged window is worth keeping in view rather than dismissing. It is small, and it is exactly the kind of change habitability rules produce. A room becomes habitable, so it needs more light than the original opening gave. Even a careful repair carries one of these.

Selected Buildings

N.87

Use: Hotel and restaurant
Evidence of occupancy: Commercial, not domestic. Terrace furniture, hotel signage on the façade, external lighting, prayer flags strung from the gallery.
Baseline survey: Arialdo Daverio, 1969 (publ. 1985)
Author's survey: 2026



[Fig 3.21] Building N.87, Baseline condition, 1969. Source: Arialdo Daverio.



[Fig 3.22] Building N.87, Current condition, 2026. Photo by the author.

Status

- [ ] I intact / in function
- [ ] F function lost
- [ ] A adapted, identity kept
- [x] X altered — identity at risk

A - Survey

Element	2026
Stone base and stable	Rendered and painted. Ground level converted to commercial entrance and terrace.
Timber body	Rendered above the base. Gallery structure exposed at first-floor level.
Gallery	Open, unglazed, unenclosed. Structure and posts retained. In use as guest terrace and circulation.
Roof and slabs	Stone slabs retained. Chimneys present.
Openings and screens	Plain balustrade at gallery level; no grigliati visible on the surveyed façade. Windows enlarged and shuttered to a domestic pattern.
Setting	Paved terrace with tables, hotel signage on the façade, external lighting, prayer flags strung from the gallery.

B - Outcome

This is the only building in the survey that operates as a business, and it is also the most heavily altered. The left portion of the timber structure has gone, replaced by rendered wall. What were deep galleries running the full width of the house are now shallow balconies covering part of it. The façade has been reorganised around regular windows in a hotel pattern, and render covers most of what was timber. Commercial conversion turns out to demand more than habitation does. A hotel needs bedrooms of a certain size with windows of a certain area, corridors and stairs meeting fire regulations, plumbing to every room, and an entrance that people can find. A Walser house was built around none of those things. Meeting them here meant rebuilding rather than adapting. The gallery that made it a Walser house is gone. This is the clearest case in the register of the conflict Chapter 2 describes. The pressure was not weather. It was the requirement to make an old house perform as a modern business.


MUSEO



[Fig 3.23] Building N.87, facade and gallery details, 2026.

3.3 Gallery comparison

The entries above looked at each building on its own. Set side by side, the eight galleries show one thing they share and one thing that separates them. All eight have lost their function. No gallery in Pedemonte dries a crop any more. That includes the two museum houses, where the structure is in the best condition in the hamlet and does no farm work at all. So functional loss cannot explain the differences between these buildings. Every building has it. What differs is form.

Condition	Buildings	Count
Grigliati intact	88, 89, 93-94, 105	4
Grigliati intact, later additions fixed over them	91-92, 95	2
Grigliati partly removed	-	0
Grigliati replaced by plain railings	96	1
Gallery structure reduced or rebuilt	87	1

[Fig 3.24] Gallery screen condition across the eight surveyed buildings.

Six of the eight galleries still have their screens. Two of those six, 91-92 and 95, already carried a partial loss from before the baseline photograph; nothing was lost from either within the period this study measures. The two that lost screens within that period were both put to a new use. At 96, the attic became rooms, and the first-floor screen is gone. The two changes may not be connected: dormers light the attic from the roof plane, one level above the gallery, so attic light needs alone do not explain why the screen below was removed. The screen may instead have been taken down to open the gallery as a terrace, or simply replaced at the end of its working life. External survey alone cannot distinguish between these. At 87, the house became a hotel. The front of the building had to work as guest rooms, so the gallery there was rebuilt. Two other buildings also wanted more from the gallery, but their owners found a way to get it without removing anything. At 95, the owner fixed horizontal rails across the lattice. The rails hold planters. The lattice is still underneath them. At 91-92, the gallery floor was replaced. The space was filled with chairs, plants and stored things. Again, nothing original was taken away. In both cases, the new work sits on top of the old fabric. So the screens survive, and the pattern is still readable. Compare this to Building 96, where the screen did not survive. The difference is not the climate, since all three buildings share it.

It is not the altitude or the age of the house either, for the same reason. The only thing that differs is the decision each owner made. This also tells us where the pattern in this section comes from. All eight buildings sit on the same slope, at the same height, under the same weather. Climate cannot explain why they differ. What explains the difference is need.

Use	Buildings	Screens intact	Screens lost
Museum	89, 93-94	2	0
Hotel and restaurant	87	0	1
Private residence	88, 91-92, 95, 96, 105	4	1

[Fig 3.25] Gallery screen survival by building use.

The museum galleries survive, which is what Section 1.3 predicts. Nobody has to be warm inside those buildings, so no habitability rule was ever triggered and no owner ever faced the choice. The hotel has lost the most, and it carries the heaviest regulatory load in the sample, because a business must meet every rule a house meets and several more. The private houses split, and that split is the finding. Four owners out of five kept the screens. One did not. The four had nothing to gain by removing them. The fifth wanted daylight for new rooms above.

Two things follow.

The first is about what identity is made of. Every gallery here has lost its purpose, and that loss costs nothing. Someone looking at an intact gallery in Pedemonte sees a Walser house, and is not troubled by the fact that no hay has dried there in fifty years. Someone looking at plain railings does not see a Walser house, even though the structure behind them is unchanged. What identifies these buildings is what can be read on them, not what they still do.

The second is about how the losses happen. They are not gradual and they are not general. Six galleries are much as Daverio recorded them, and in the two that changed, someone changed them for a reason. Nothing here looks like slow erosion. It looks like a small number of decisions, each taken by an owner who wanted something the gallery was standing in the way of.

3.4 Vulnerability matrix

The matrix draws the building records together into a single diagnostic picture. It works at two levels. The first sets each of the five elements against the three variables defined in Section 1.7, so that the prediction made at the end of Chapter 2 can be tested against evidence rather than against the building type. The second places each surveyed building in one of the five outcomes established in Section 3.1, crossing its condition against its use and occupation.

Element-level Analysis

Section 1.7 defined conflict as the coincidence of three conditions on a single element: high vulnerability, high significance, and regulation tight enough to prevent adaptation. Section 2.3.7 predicted that only one element of the Walser house satisfies all three. The element table below records, for each of the five elements, the risk it faces, the significance it carries, and what regulation permits. Risk here combines physical exposure with functional obsolescence, since an element may be threatened because it is decaying or because nobody needs it any longer, and in practice the two compound. Significance follows the assessment made element by element in Section 2.3. The regulatory column records whether alteration of that element requires permission in practice, which is a different question from whether it is protected in principle, and Section 3.5 examines the gap between the two.

	Risk	Significance	Regulation
Stone base	M	M	Loose
Timber body	H	H	Moderate
Gallery	H	H	Tight[1]
Roof	M	M	Tight
Screens (grigliati)	H	M-H	Loose

Medium (M), High (H).

[1] Confirmed against Article 7 of the Alagna PRGC's norme di attuazione — see Section 3.5.

[Fig 3.26] Vulnerability matrix: risk, significance, and regulation for each of the five elements.

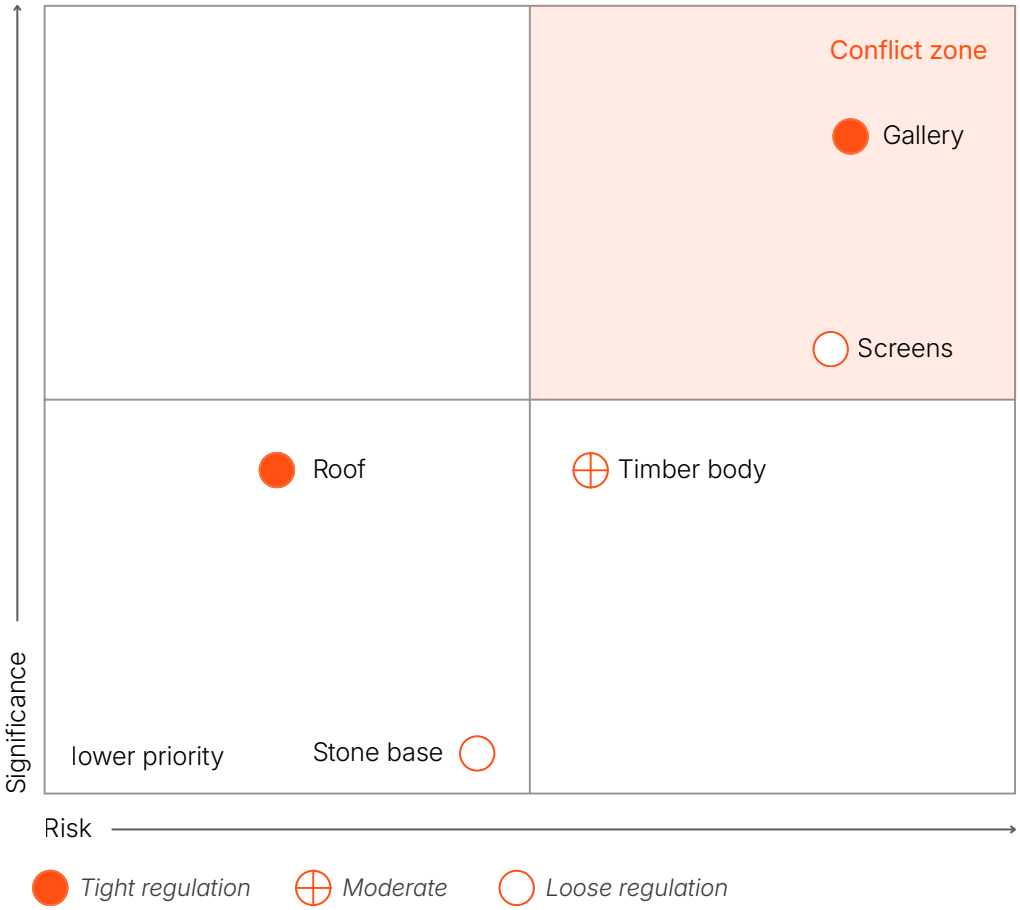
Two results follow, and the second was not predicted. The gallery is the only element carrying high risk, high significance and tight regulation together. That is the conflict Section 1.7 defined, and its appearance in the survey confirms the reading of Chapter 2 rather than merely illustrating it. The screens, however, occupy a position the framework did not anticipate. They carry risk and significance close to the gallery's, and almost no effective regulation, because they are small enough to alter without a permit and invisible from the distance at which these buildings are judged. The gallery is therefore protected and contested, while the screens are neither. Two elements of comparable importance fail in opposite ways: one is fought over, the other simply disappears. The framework of Section 1.7 identifies where conflict occurs. It does not identify where loss occurs without conflict, and the screens show that the second category exists.

Building-level Outcomes

Building	Use	Occupation
87	Hotel and restaurant	Commercially operated
88	Private residence	Occupied
89	Museum, Casa Museo Walser	Visited, not inhabited
91-92	Private residence	Occupied
93-94	Museum, Casa Museo Walser	Visited, not inhabited
95	Private residence	Occupied
105	Private residence	Occupied
96	Private residence	Occupied

[Fig 3.27] Building-level outcomes: use and occupation across the eight surveyed buildings.

Risk × Significance



[Fig 3.28] Risk and significance of the five elements, plotted against regulation tightness. The gallery falls in the conflict zone defined in Section 1.7.

Section 2.3.7 predicted that only the gallery would satisfy all three conditions. The survey confirms it. The survey adds the screens' position. They carry risk comparable to the gallery's and significance close behind it, and almost no effective regulation, because they are small enough to alter without a permit and invisible from the distance at which these buildings are judged. Section 1.7 identifies where conflict occurs. It does not identify where loss occurs without conflict, and the screens show that the second category exists. The roof makes the same point from the other direction. It is tightly regulated and faces moderate risk, so protection here is working where it is least needed. Regulatory attention in Pedemonte tracks visibility rather than vulnerability, and Section 3.5 examines why.

3.5 Forces acting on adaptation

The survey has shown what has changed in the houses of Pedemonte and where, and it has confirmed that change falls most heavily on the gallery and its screens. But a record of change is not an explanation of it. An element is not altered or lost by the physical force of climate alone. It is altered because someone chooses to alter it, within a framework of rules that may permit, require or forbid the work, and that person's decision is shaped by forces that have nothing to do with weather.
This section examines those forces. It treats regulation first as something that protects these buildings, then as something that can constrain or distort how they are repaired, and finally turns to the interventions that fall outside the framework altogether. Together with the physical mechanisms of Chapter 1, these forces complete the account of what determines whether a Walser element survives intact, survives altered, or disappears.

3.5.1 Regulation that protects

The Walser houses of Pedemonte are not unprotected buildings. They fall under a layered system of heritage and landscape regulation operating at national and regional levels, whose purpose is to prevent exactly the kind of loss Chapter 2 identified as a risk.

At national level the governing instrument is the Code of Cultural Heritage and Landscape, the Codice dei beni culturali e del paesaggio, which establishes the legal categories of protected cultural property and protected landscape and sets out the controls that apply to them (Codice dei beni culturali e del paesaggio, 2004). Where a building is formally recognised as cultural heritage it becomes subject to a vincolo, a binding constraint under which works affecting it require authorisation from the competent heritage authority. The body exercising this control on the ground is the Soprintendenza Archeologia, Belle Arti e Paesaggio, the territorial office of the Ministry of Culture responsible for approving or refusing interventions on protected buildings and landscapes in its province. The effect of this system, where it applies, is that an owner cannot lawfully alter a protected building's significant features without review. That gives the public authority a direct means of preventing the removal of precisely the identity-bearing elements this thesis is concerned with: the gallery, the screens, the roof.

At regional level, protection runs through the landscape plan. Piedmont has an approved Regional Landscape Plan, the Piano Paesaggistico Regionale, which identifies landscapes of recognised value and sets rules for what may be done within them (Regione Piemonte, n.d.). The plan matters for Pedemonte both because the alpine landscape of the upper Valsesia is the kind of setting such plans are designed to protect, and because the existence of an approved regional plan carries independent legal weight, as the next section shows. Alongside it, municipal planning instruments govern what may be built and altered within the settlement.

Taken together, these instruments form a protective framework whose logic aligns with the conservation aim of this thesis. They treat the historic building as a public interest and not only as private property. They require expert review before significant change. And they recognise both the individual building and its landscape as values to be safeguarded. In principle this framework is the mechanism through which the vulnerabilities identified in Chapter 2 could be managed, since it gives the state the power to refuse the alterations that would erase a building's identity.

The difficulty, as the following sections show, is that regulation does not only protect. It can push repair in directions that conflict with conservation, and the same framework that can prevent harmful change can, in its detail, require it.

3.5.2 Regulation that constrains or distorts

Regulation shapes what an owner is permitted or required to do when they intervene, and that shaping does not always favour the preservation of vernacular form. Two kinds of conflict arise. The first is the standing tension between modern building requirements and historic fabric. The second is the instability of the regional rules themselves, which in Piedmont has recently been the subject of a Constitutional Court ruling bearing directly on the buildings of this study.

The standing tension is familiar in conservation practice. Modern requirements for habitability, energy performance, safety and sanitary standards are written for contemporary buildings, and applying them to a historic house can force changes that damage its character. A requirement to enlarge openings, raise ceiling heights, insulate walls or convert an attic to habitable space can each conflict with the very features that make a Walser house what it is.

An owner seeking to bring a house into modern use may therefore find that compliance and conservation point in opposite directions. This is the mechanism by which a rule, even a well-intentioned one, can require the alteration of an identity-bearing element rather than prevent it.

The instability of the regional rules is the sharper and more recent problem. In 2022 Piedmont passed a law of urban and building simplification, Regional Law 7/2022, intended to ease and accelerate building interventions, including measures on the recovery of attics, on volume incentives, and on what counts as an essential variation from an approved project (Regione Piemonte, 2022). The national government challenged the law before the Constitutional Court, and in July 2024 the Court, in judgment 119/2024, struck down several of its provisions as unconstitutional (Corte Costituzionale, 2024). Those that fell included provisions extending volume bonuses to previously condoned unauthorised buildings, provisions allowing an indiscriminate recovery of attics in conflict with planning instruments, and provisions setting regional definitions of essential variation that departed from the national standard. These are not abstract points. The recovery of attic space and the threshold of essential variation are precisely the kinds of rule that determine whether the upper level of a Walser house, the barn and its screens, can be converted, and on what terms. The concrete instrument governing this kind of intervention is Regional Law 21/1998, whose substance now sits within Article 6 of Regional Law 16/2018: dormers and skylights are permitted in attic recovery provided ridge and eave heights are unchanged and the addition remains consistent with the building's overall formal and structural character. The legal status of these interventions was directly unsettled by the ruling, and the register contains an instance of exactly the class of work at issue: Building 96, where three dormers now light converted attic rooms.

One feature of the judgment runs the opposite way and deserves attention. The government had also challenged the law on the ground that it weakened landscape protection, but the Court rejected that part of the challenge, holding that Piedmont's approved Regional Landscape Plan already provided the necessary protection, so the regional law did not offend the constitutional allocation of authority over landscape (Corte Costituzionale, 2024). This matters in two ways. It confirms that the landscape plan discussed in Section 3.5.1 carries real legal force.

And it shows that the protective and permissive parts of the regulatory system were tested at the same moment and resolved differently, with the landscape protections upheld while several of the simplifying provisions were struck down.The regulatory picture facing a Pedemonte owner is therefore not a stable set of permissions but a shifting one, in which what was allowed in 2023 may not have been allowed in 2024, and in which the protective and the permissive pull against each other inside the same body of law. Regulation cannot be treated as a single force that simply defends the building. It both protects and distorts. It can prevent the removal of a gallery, and it can, through habitability and attic rules, create the pressure to enclose one. It is stable enough to give the landscape plan real weight and unstable enough that the rules on essential variation were rewritten by a court within the period of this study. An owner deciding what to do with a Walser house is navigating not only the physical decay described in Chapter 1 but a regulatory landscape pointing in more than one direction at once.

3.5.3 Undocumented and unauthorised interventions

The two preceding sections have treated regulation as a system that operates: protecting in some directions, distorting in others, but in either case reaching the building. This section concerns the interventions it does not reach. Section 3.4 gave the reason to expect them. The screens carry risk comparable to the gallery's and significance close behind it, and almost no effective regulation. That combination makes them the element most likely to be altered without any process at all. Removing a lattice of larch battens and fitting a plain rail is small work. It needs no scaffolding, no contractor and, on many readings of the rules, no permission. It is invisible from the road, and invisible from the museum path a few metres away.

The register records exactly that alteration on more than one building. This survey cannot state that any particular intervention on any named building was unauthorised. As Section 3.1 explained, such a claim would be impossible to verify from outside observation and inappropriate to make about identifiable private owners. What can be observed is the class of work: alterations small enough in scale, and low enough in visibility, that they would be unlikely to trigger review even where review is formally required. The distinction matters for how the protective framework should be assessed.

A rule challenged in court, as Regional Law 7/2022 was, is a rule that is operating, and the outcome of that challenge is recorded and binding. A rule that is quietly not applied leaves no record at all. The first kind of failure is visible in the law reports. The second is visible only in the buildings, and then only to someone comparing them against an earlier record. This is where the matched-pair method earns its place. A survey of Pedemonte as it stands today would show galleries with plain railings and could say nothing about whether those railings replaced anything.

Read against Daverio's plates, the same galleries show a removal. The baseline converts a present condition into a documented change, and it is the only instrument in this study capable of registering interventions that left no administrative trace. Two consequences follow. Where an intervention is undocumented, the protective framework of Section 3.5.1 has not failed in its design but in its application, since a rule that is not enforced cannot protect. And the elements most exposed to this kind of failure are precisely those the framework of Section 1.7 identifies as significant but loosely regulated, which is to say the screens above all.

Taken with the preceding sections, this completes the account of the forces acting on a Walser house: the physical force of a changing climate, the divided force of a regulation that both protects and distorts, and the accumulated choices of owners acting within, around, or entirely outside the rules.

This thesis asked whether the vernacular buildings of Pedemonte can adapt to a changing climate without losing the identity that makes them worth preserving. The preceding chapters have shown that this question cannot be answered with a single yes or no, because the threat does not fall evenly across the building. The answer is element by element, and it is in the pattern of those separate answers that the real finding lies.

C.4

4.1 The research question answered element by element

The question this thesis asked was whether the vernacular buildings of Pedemonte can adapt to a changing climate without losing the identity that makes them worth preserving. The answer is different for each element of the house, and the differences are what make the answer useful.

The stone base can adapt, and the reason is instructive. Of the five mechanisms set out in Chapter 1, the one that dominates the base is freeze-thaw, and Section 1.5.3 established that freeze-thaw cycling at Pedemonte's elevation is projected to decline rather than rise. What has changed is the snowpack that used to insulate the foot of the wall, so the cycles that still occur reach stone that was once protected, and the two movements roughly cancel. The physical situation is not deteriorating.The survey nevertheless found the base among the most consistently altered elements in the hamlet, through replaced doors and windows, paved entrances, new external staircases and metal railings. That combination is itself the finding worth keeping. Freeze-thaw is the one mechanism in this study projected to ease rather than worsen, and yet the base it threatens is among the most altered elements in the hamlet. The threat is declining while the alteration continues, so something other than the threat is driving the change. What drives the change is the stable below, which lost its animals and with them the warmth that made it part of the heating system, leaving a cool damp volume at ground level that a modern household wants as habitable space. The base can adapt because it carries less identity than any other element, so change here costs little. Adaptation is possible, and it is already happening, for reasons that have nothing to do with the weather.

The timber body can adapt, but only if someone maintains it. This is the one element where Alpine evidence shows a clear and substantial worsening. The Scheffer index for fungal decay is projected to rise by roughly half through the century, and the Alps have until now been among the lowest decay-hazard environments in Europe, so what is happening here is the withdrawal of an old protection rather than the arrival of a new threat. Even so, the survey showed that decay proceeds at a rate people set rather than a rate the climate sets. Where overhangs still throw water clear, where joints stay sealed, where damaged members are cut out before the damage travels, the Blockwerk has lasted five centuries and continues to. Where maintenance lapses, or where cement mortars and impermeable sealants trap moisture against the wood, decay outruns anything the projections predict. The timber body can adapt, and repair in kind preserves it, but its future depends on whether the maintenance tradition that has always contained the mechanism is still practised.

The roof can adapt, and its adaptation protects four other elements. Snow loading is changing in character rather than in quantity, lighter on average and heavier at the peak, and the roof was designed against the average. Yet the survey found the roof among the best-preserved elements, and where slabs fail the traditional practice of replacing them singly is exactly the right response. Where the roof is rebuilt, the driver is not the weather but the decision to occupy the loft beneath it. Converting that volume turns the roof into an external wall, and Italian energy rules then apply in full, bringing insulation, dormers, light ratios and structural verification with them. The roof can adapt without loss of character. Whether it does depends on whether the space below is converted.

The screens can adapt, and nothing is protecting them. Section 3.4 produced a result the framework did not predict. The grigliati carry risk comparable to the gallery's and significance close behind it, and almost no effective regulation, because they are small enough to alter without a permit and invisible from the distance at which these buildings are judged. The survey recorded their replacement by plain railings on more than one building. Nothing compels their removal and nothing effectively prevents it, so they disappear without a permit, without a record, and without anyone outside the household noticing until the pattern has gone from the whole hamlet. Their survival is not a technical question. It is a question of whether a rule that nobody applies can be said to protect anything at all.

The gallery is where the answer becomes hardest. The gallery is the most identity-defining element of the Walser house, and it is also the element whose original purpose has vanished most completely, since no gallery in Pedemonte still dries a crop. Thermal stress acts on it more severely than on any other element, because it is thin, unheated and open on every side. But the physical pressure is not what threatens it. What threatens it is that an owner has no use for an open unheated walkway outside a heated interior, while conservation regulation watches the gallery more closely than anything else on the building. Everything the owner needs it to become, the rules forbid. Everything the rules preserve, the owner has no living use for. Section 3.4 confirmed that the gallery is the single element carrying high risk, high significance and tight regulation together, which is the definition of conflict Section 1.7 gave, and the survey found it among the most altered elements in the hamlet.

What the eight buildings show together. Read across the sample, one comparison carries more weight than any individual finding. Two of the eight buildings are museums, and they are the best-preserved in the hamlet. They stand on the same slope, at the same altitude, under the same rainfall and the same lost snowpack as their neighbours, so their climate exposure is identical. What differs is that nobody has to be warm inside them. They were not preserved because they resisted change. They were preserved because the demand for change was removed.

That is the answer to the research question, and it is not the answer the title anticipates. These buildings can adapt to a changing climate. Most of their elements can be repaired, renewed or modernised without losing what makes them legible as Walser. What they cannot easily do is satisfy two bodies of law that ask opposite things of the same fabric, one written to keep a historic building unchanged and one written to make a house fit to live in. Climate change did not create that conflict. It raised the cost of leaving it unresolved.

4.2 The gallery paradox as the central finding

The paradox

The central finding of this thesis can be stated as a paradox. The element most worth protecting is the element least able to survive. The gallery carries the identity of the Walser house more completely than anything else on it. A house is recognised as Walser, at a distance, because of the deep timber gallery wrapping its upper storeys, and no other element does that work. It is also the element whose original purpose has disappeared most completely. It was built to dry rye, hemp and hay in open air before winter storage, and no gallery in Pedemonte dries a crop today. A form everyone can read, attached to a function nobody needs.

Why the gallery is different in kind

Every element of the house has faced the same question over the last century, does it still do the job it was built for? Four of the five have an answer. The gallery does not.

Element	Original function	What happened to it
Stone base	Stable, animal heat	Function lost, replaced by habitable space
Timber body	Structure and enclosure	Function intact
Roof	Shelter and load	Function intact
Screens	Bird exclusion, shading	Function lost with the gallery's
Gallery	Drying the harvest	Function lost, nothing replaced it

[Fig 4.1] Original function and current status of the five architectural elements.

The deadlock

The two halves of the paradox generate opposite pressures on the same fabric. Because the gallery defines the type, conservation regulation watches it more closely than anything else on the building, and its enclosure or removal requires landscape permission. Because it no longer does anything, the owner sees no reason to keep an open, unheated walkway outside a heated interior, and modern living wants the enclosed volume, for the extra room and the thermal continuity. Everything the owner needs the gallery to become, the regulation forbids. Everything the regulation preserves, the owner has no living use for.

This is why the conservation of the Walser house reduces neither to a technical problem of keeping timber sound nor to a legal problem of preventing alteration. Both would be soluble. The gallery presents something harder: an element whose cultural meaning survives its function, standing on a house that somebody has to live in.

Three responses

1. **Keep it open and screened. Preserves identity, accepts permanent disuse.** This is what the museum buildings do, and Section 3.4 showed why they can afford to: nobody has to be warm inside them. For an inhabited house it means maintaining a substantial timber structure, exposed on every side and subject to the most severe thermal cycling of any element, for no return beyond appearance. Some owners in Pedemonte have done exactly this and the survey found their galleries intact. It is preservation without adaptation, and it holds only as long as the owner carries the cost.

2. **Enclose it. Recovers the volume, ends the element.** Section 3.1 set out why this survey treats enclosure as a loss of identity rather than an adaptation. The openness is what distinguishes a gallery from a balcony, and glazing ends it however carefully the work is detailed. The structure may remain physically present behind the glass, but what a viewer reads is no longer a Walser gallery. This is adaptation without preservation.

3. **A third path.** Keeps the gallery legible and gives it a reason to exist. This thesis does not have to invent this path. The survey already recorded it. At 88, firewood stored in the gallery keeps someone walking through it and looking after it. At 91-92, the space holds chairs, plants and stored things. At 95, planter rails were fixed over the grigliati rather than replacing them. In each case, low-intensity domestic use keeps the gallery open, keeps the screens in place, stays legible from a distance, and gives the household below a reason to maintain it. The survey establishes what any solution would have to satisfy, and three buildings in the register already satisfy it.

Maintenance follows use

One principle runs through the whole survey, and it decides the gallery's future more than any regulation does. Maintenance follows use. The timber body lasted five centuries not because larch is durable but because somebody kept working on

it, replacing damaged members, renewing overhangs, keeping joints sealed. The galleries that lapsed are the ones nobody needed. The museum buildings are maintained because an institution funds their upkeep, not because their fabric is superior to their neighbours'. An element that earns nothing for the household below it will eventually stop being repaired, whatever the rules say. This is also why the first response is unstable over decades rather than merely expensive. Preservation without use is not a settled condition. It is a slow withdrawal, paid for by whoever is willing, for as long as they are willing.

What a third path would have to satisfy

The survey establishes four conditions, and they are narrower than they might appear.

Condition	Established by
i. The element stays open	3.1: enclosure ends it
ii.The screens remain	3.4: the detail most readily lost, and the one that distinguishes a Walser gallery from a balcony
iii. It stays legible at the distance these buildings are judged from	2.3.4: recognition operates at a distance
iv. It earns something for the household below	2.3.3, 3.4: maintenance follows use

[Fig 4.2] The four conditions a third path would have to satisfy, and where each is established in the thesis.

Three buildings in the register meet all four conditions at once. At 88, firewood stored in the gallery satisfies (i), (ii) and (iv) together: the loggiato stays open and screened, and looking after stacked wood is enough to keep somebody walking through it. At 91-92, chairs, plants and stored belongings do the same work. At 95, planter rails were fixed over the grigliati rather than replacing them, so the screen survives underneath a use that gives it a reason to be checked. None of these buildings required enclosure to become useful again. What they needed was permission to be used lightly, for storage and passage, rather than for horticulture. The third path this thesis was looking for is not a proposal. It is already practised at three of the eight surveyed buildings.

4.3 The instrument and how to use it

This thesis produced a method as well as a finding. The survey used at Pedemonte was built for this hamlet, but nothing in it is specific to Pedemonte. It can be applied wherever a baseline record exists and buildings of a recognised type are still standing.

The five diagnostic questions:

	Question	The mistake it prevents
1	Which mechanism actually dominates this element, and is it worsening?	Assuming exposure equals threat, the stone base is most exposed and its mechanism is easing
2	Is the element still physically present, and is it still legible from outside?	Confusing concealment with destruction, render is reversible, removal isn't
3	Does the intervention remove the element, conceal it, or leave it?	Judging interventions by whether the new material looks sympathetic
4	Is the pressure coming from the climate or from a habitability requirement?	Attributing problems caused by building regulations to weather conditions
5	Do the rules watch this element, or not?	Assuming significance brings protection, the screens have neither

[Fig 4.3] The five diagnostic questions of the survey instrument, and the mistake each one prevents.

What the instrument is not:

It produces	It does not produce
A diagnosis of what is happening to an element and why	A prescription for what should be built
An identification of where the difficult cases lie	A resolution of those cases
A differentiated set of priorities	A design

[Fig 4.4] What the survey instrument produces and does not produce.

4.4 What this groundwork enables

This thesis has not proposed a way to strengthen the Walser house against climate change, nor resolved the gallery paradox. It was never intended to. What it set out to do was harder to see and, in the end, more necessary: to establish the ground on which that work must rest. Before anyone can say what to build on a Walser house, somebody has to say what is actually happening to it, building by building and element by element, against a dated baseline, and that had not been done in these terms. That is what this thesis offers. Not a proposal, but a diagnosis. An account, element by element and building by building, of what is at risk, why, and under what pressures. It is unglamorous work and it is the work that was missing.

Its value is that it makes the next question askable. The design problem, how to make a Walser house more resilient while keeping it legibly itself, has been discussed in the abstract for as long as these houses have been protected. It cannot be approached responsibly without knowing which element is threatened by what, and which threats are real. This study establishes that for Pedemonte, and it does so against a record made sixty years ago, which means the changes it reports are documented rather than assumed.

Three things carry forward from it. The catalogue can be extended, to the remaining houses of the hamlet and to any Walser settlement where a comparable baseline survives, using the same instrument and yielding comparable results. The matrix turns an undifferentiated anxiety about loss into a differentiated one: five elements, not equally at risk and not equally protected, rather than one undivided fear for the building as a whole. That distinction, not a ranking, is what a conservation authority with limited resources actually needs first. And the gallery paradox names the hardest case, and frames it tightly enough that a designer could begin.

One finding runs beneath all of it, and it deserves the last word. These houses were not preserved by their materials, or their siting, or the rules written to protect them. Larch decays. Stone weathers. Rules go unenforced, and the survey found the elements that no one watches disappearing without trace. What preserved these buildings was that somebody kept using them, and kept repairing them because they were used. Five centuries of small work, done by people who needed the house to keep standing through another winter. The two museum houses in Pedemonte are the exception that proves the rule. They survive in the best condition of any in the hamlet, and they survive because an institution now performs the maintenance that use once compelled. Every other house in the hamlet still depends on a household finding a reason to keep it.

That's why the gallery holds a significant place in its own right. It's the first, and likely the last, element in the history of this type of structure to lose its meaning. What happens to it in the next generation will be a test of whether a building can retain its meaning even when it no longer serves any purpose. The problem is real, specific, and urgent. The groundwork is now solid enough to begin work on a solution.

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