The Breathing Wall: Porosity, Light, and Tectonic Memory in Peter Zumthor's Shelter for Roman Ruins

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Submission Date: 30.01.2026 / Acceptance Date: 09.02.2026

ABSTRACT

This article re-examines Peter Zumthor's Shelter for Roman Ruins in Chur within the context of architectural conservation, focusing on the interrelated roles of light, material, and tectonic logic. Rather than adopting the modernist "glass box" approach that isolates historical remains from their environmental and temporal setting, the study advances an alternative understanding of preservation grounded in porosity and atmospheric experience. The research is based on a qualitative single-case architectural analysis, in which the Chur Shelter is examined as a representative example of contextual conservation architecture. The analytical framework draws on phenomenological thought and is informed by Gottfried Semper's concept of *Bekleidung*, which understands architectural surface as a spatial membrane, and by Kenneth Frampton's notion of tectonic culture, which emphasizes constructional articulation and material expression. Within this framework, particular attention is directed to the permeable timber lamella wall system and the organization of interior circulation. The findings indicate that light operates in this project not simply as a means of illumination, but as an active architectural agent that shapes perception, constructs atmosphere, and mediates between past and present. The discussion further demonstrates how the building's "breathing" envelope—defined by light, shadow, and material aging—intensifies spatial experience and situates the archaeological remains within a living environmental context rather than presenting them as a static historical exhibit. The article concludes by suggesting that Zumthor's Shelter for Roman Ruins offers an alternative model for conservation architecture, one in which memory is activated through atmosphere and light is understood as a constitutive material of architectural meaning.

KEYWORDS

Architectural conservation, Daylight, Tectonic articulation, Phenomenology, Peter Zumthor, Shelter for Roman Ruins.

INTRODUCTION

The question of how to preserve and present historical ruins in architecture remains a controversial issue today. Contemporary conservation approaches, especially developed under the influence of twentieth-century modernism, mostly adopted object-centered strategies and isolated archaeological remains from their environmental, spatial, and temporal contexts. While these approaches prioritize visual readability and physical protection, they detach historical relics from experience and transform them into stationary exhibition objects. In this context, light is generally considered not an experiential component but a technical, neutral tool. However, this study argues that light should be rethought as an architectural material; it can play an active role in the production of memory, atmosphere, and contextual continuity in conservation architecture.

In architectural design, light is not just a passive element that enables vision; it is a fundamental building component that enables the perception of space, form, and texture. Materials, by nature, do not have poetic or atmospheric qualities; These qualities emerge only through the relationship they establish with the light. Peter Zumthor's concept of "material radiation" emphasizes that architecture can gain emotional depth and spatial existence through the interaction of light and material. In this respect,

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architecture can be considered a practice that gives meaning to space through the conscious direction of light.

Peter Zumthor's design approach, one of the leading figures of phenomenological architecture, is closely related to his professional background. While carpentry training develops tactile sensitivity to the material, the monumental conservation work carried out in the Canton of Grauben deepened his awareness of historical stratification and the spirit of the earth. These experiences have enabled the material in Zumthor's architecture to be considered as an environment that acquires perceptual and sensory qualities through light rather than a technical element. In this context, light is not only illuminating in Zumthor's structures; It becomes an element that activates the atmosphere, memory, and spatial experience. Transparent, climate-controlled "glass box" typologies, to which the modernist understanding of protection is frequently invoked, disconnect the historical object from its surroundings and the flow of time. The Roman ruins protection structure in Chur offers a critical alternative to this approach. The structure establishes a controlled relationship with light and air through a permeable shell of wooden lamellas rather than a showcase that completely insulates the archaeological site. This system constructs the structure as a spatial membrane that filters light rather than a massive boundary, in line with Gottfried Semper's theory of waiting. Thanks to the filtering of daylight and changes in atmospheric conditions, the remains are not perceived as frozen historical objects but as part of a temporal experience that overlaps with the concept of *utsuroi* (transience) in Japanese aesthetic thought, which emphasizes continuity and temporality. In this respect, the structure reveals an experiential and contextual architectural approach to modern conservation paradigms.

RESEARCH METHOD

This study adopts a qualitative architectural research approach based on interpretive and phenomenological analysis. The research has been structured as a single case study that centers on the Roman Ruins Conservation Structure (Shelter for Roman Ruins) in Chur, an original example of contemporary conservation architecture in its relationship with light, materials, and tectonic expression. The choice of this example is based on its deliberate separation from object-centered, disconnected preservation models and its architectural importance.

The analytical framework brings together theoretical approaches derived from phenomenological discourse and the theory of architecture. In particular, Gottfried Semper's concept of *Bekleidung* and Kenneth Frampton's understanding of tectonic culture serve as the main references for this framework. These theoretical approaches are used to guide the reading of the structure's spatial organization, material setup, and daylight strategy. The analysis process is based on a detailed examination of architectural drawings, photographs, and secondary literature; In particular, it focuses on the relationship between light, shell/cover system, and user experience. This study, which does not aim to generalize, aims to develop an in-depth understanding of how architectural meaning is produced through atmospheric and tectonic strategies in a certain context.

THEORETICAL FRAMEWORK: LIGHT, MATTER, AND TECTONICS

This chapter develops the article's theoretical framework by treating light not only as a physical phenomenon but also as a phenomenological and atmospheric factor in architecture. First, it is clarified how light shapes perception, material experience, and a sense of temporality; then this discussion is situated in the context of Gottfried Semper's theoretical approach to plating (*Bekleidung*) and tectonic theory. Through this perspective, light is considered an effective architectural environment that mediates between structure, material, and meaning.

PHENOMENOLOGICAL LIGHT AND ATMOSPHERE

Comprehending the role of light in architecture requires engaging its perceptual and phenomenological dimensions, going beyond its physical definition. Technically, light refers to the visible part of the electromagnetic spectrum corresponding to the wavelengths between 380 and 780 nanometers (Alkan, 2010; Fabric, 2020). Physiologically, light is the energy that starts the vision process by interacting with the human eye (Çelik, 2020). But in the architectural context, light cannot be reduced to a neutral tool that merely enables visibility. In architecture, light functions as a basic "building material" that makes spatial reality, form, and texture become perceptible (Phillips, 2004). Architectural form cannot be experienced without light, because objects gain their existence only through lighting and are separated from their environment through shadows (Kocaoğlu, 2011).

Beyond its physical properties, light plays a decisive role in shaping the architectural atmosphere and emotional experience. It contributes to the character of the space, that is, the spirit of the earth (Genius Loci), and establishes a direct, sensory relationship between space and the user (Can, 2018; Meyghani, 2019). In phenomenological discourse, light is considered a dynamic force that animates stationary substances and connects form to space. From this point of view, architecture is not just the construction of physical boundaries; It is the process of establishing spatial meaning through the direction of light (Meyghani, 2019).

In Peter Zumthor's architectural thought, the interaction between light and material is expressed through the concept of "material radiance". According to Zumthor, materials such as wood, stone, or concrete, by nature, do not have poetic or expressive qualities. These qualities are revealed only through their encounters with light. Until this interaction occurs, the material remains perceptually silent. When illuminated, it becomes a "sensitive carrier" that filters light and creates a space-specific atmosphere (Meyghani, 2019). This relationship is reciprocal: while light makes the material visible, the material also makes the light itself perceptible (Erduman, 2000). Therefore, the role of the architect is to consciously organize this interaction through material selection and tectonic editing.

Light gives the architectural space a temporal dimension at the same time. As a variable and dynamic phenomenon, it continually alters perceptions of surfaces and tissues throughout the day. In Japanese aesthetic thought, this situation is expressed through the concept of *utsuroi*, which conveys the experience of ephemerality arising from changing light and shadow. In this context, space is perceived not as a static container, but as a memory of a process that transforms in continuity. Thanks to temporal variability, architecture ceases to be a frozen image; it becomes an experience of "becoming," in which the borders soften, and the material's existence evolves over time (Erduman, 2000).

SEMPERIAN PERSPECTIVE: LIGHT AS 'CLADDING'

The relationship between architectural surface, tectonic expression, and light can be considered through the theoretical framework developed by nineteenth-century theorist Gottfried Semper. Semper defines the siege (enclosure) as one of the fundamental origins of architecture in his work The Four Elements of Architecture and bases this concept on early textile practices, such as woven, hanging carpets and screens, which define space independently of the carrier structure (Semper, 1851/1989). From this point of view, the architectural surface is understood as a spatial and symbolic membrane that mediates between the inside and the outside rather than a structural necessity.

Semper's tectonic and stereotypical separation of structures further clarifies how light interacts with the architectural form. While tectonic structures consist of combined linear elements, usually defined

through joints and frames; Stereotomic structures are based on the massiveness and continuity of heavy materials such as stone or concrete (Frampton, 1996; Kocaoğlu, 2011). In tectonic systems, light reveals the structure's rhythm and construction logic; it emphasizes massiveness and volume in stereotomic architecture. This distinction reveals that light is not only an element that serves visual perception, but also a tool that expresses the basic construction logic of architecture.

One of Semper's most influential concepts, *Bekleidung* (coating), positions architectural meaning on the encompassing surface rather than on the carrier core. Even if this understanding of textile origin is transferred to solid materials through material transformation (Stoffwechsel), the surface metaphorically continues to function as a garment that surrounds the space. In this context, light can be read as an effective element that strengthens the textile character of the architectural siege. The mass is visually dissolved through the filtration, softening, or disintegration of light; Architectural surfaces, on the other hand, cease to be massive obstacles and become layers that mediate.

This approach is further deepened by Karl Bötticher's distinction between *Kernform* (core form) and *Kunstform* (artistic form), which was later developed by Semper and reconsidered in contemporary tectonic theory. While *Kernform* expresses the carrier and mechanical reality of the structure, *Kunstform* corresponds to its symbolic and expressive dimension (Mallgrave, 2006; Kocaoğlu, 2011). Light plays a critical role in this transformation process: while keeping the structural nucleus perceptually in the background, it highlights the architectural surface. In this context, light is not an element that hides the structure; It is an effective architectural tool that reinterprets it, allowing architecture to be perceived as a holistic and meaningful expression, not just a technical mechanism.

CONTEXT AND DESIGN STRATEGY

This section situates the Roman Ruins Conservation Structure within its historical, urban, and intellectual context, clarifying how the specific conditions of the ground inform Zumthor's design decisions. Then, the spatial and massive strategy of the building is examined; it focuses on how memory is constructed through abstraction, without resorting to a one-to-one remake. Through this discussion, it is revealed how context, history, and architectural logic form a strict integrity within the structure.

CONTEXT OF THE BUILDING AND DESIGN STRATEGY

The Roman ruins conservation structure, designed by Peter Zumthor in Chur, the capital of the Graubünden canton, is one of the architect's early works. Although produced at a relatively early stage of his career, this structure is considered one of the clearest manifestos of Zumthor's approach to ground specificity and memory-building. The project area is located at the border of the city's Old City (Altstadt) and includes the foundation walls of three distinct Roman periods unearthed during excavations conducted in the 1970s (Figure 1) (Lorentz, 2021). However, these remains do not form a holistic or sterile archaeological park. On the contrary, it continues to exist as fragmented and largely forgotten historical traces embedded in the urban fabric; Some parts are under the adjacent contemporary structures (Figure 2).

Figure 1. *Emplacement Plan 1:5000. Parramon Verdú, M. (2025).*

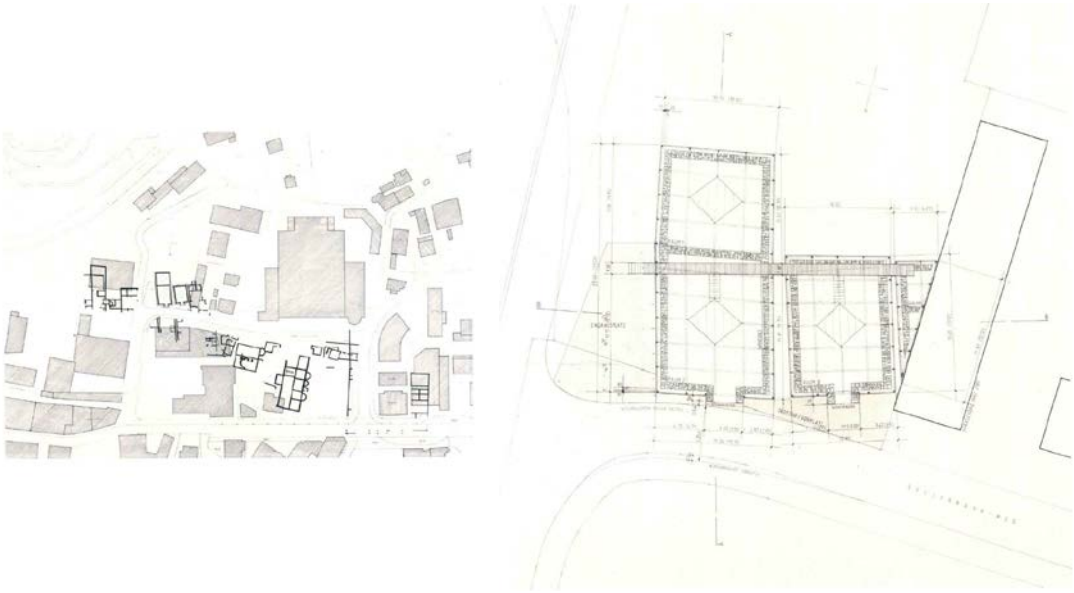

Figure 2. *Old roman ruins (left), plan of the museum (right). Buildings and Projects, Peter Zumthor, Volume 1, Page:36-37.*

To understand the conceptual basis of this project, it is necessary to refer to a formative period in Zumthor's personal history: about ten years of experience at the Monument Protection Agency (*Denkmalpflege*) of the Canton of Graubünden between 1968 and 1978. In this process, Zumthor worked on the architectural analysis of historical villages; He documented local building cultures, local (vernacular) construction techniques, and the relationship between historical layers and topography (Lorentz, 2021). This work practice is not through an abstract theoretical framework that processes its history from top to bottom; it enabled him to grasp the material, details, and construction information through a bottom-up reading method, which centered on the center. In this context, the project in Chur is not just an architectural design problem for Zumthor; it can also be considered an archaeological responsibility and a practice for protecting the spirit of the earth. In the building's design process, Zumthor consciously rejected the traditional museum typology. The structure is not a display-oriented,

climate-controlled, and isolated art gallery; While protecting archaeological remains from external physical factors, it is designed as a "protective machine" that keeps them associated with urban life (Figure 3). This approach, defined as *Schutzbauten* (protective structures) in German, reveals the character of a structure that observes both protective and contextual continuity (Lorentz, 2021).

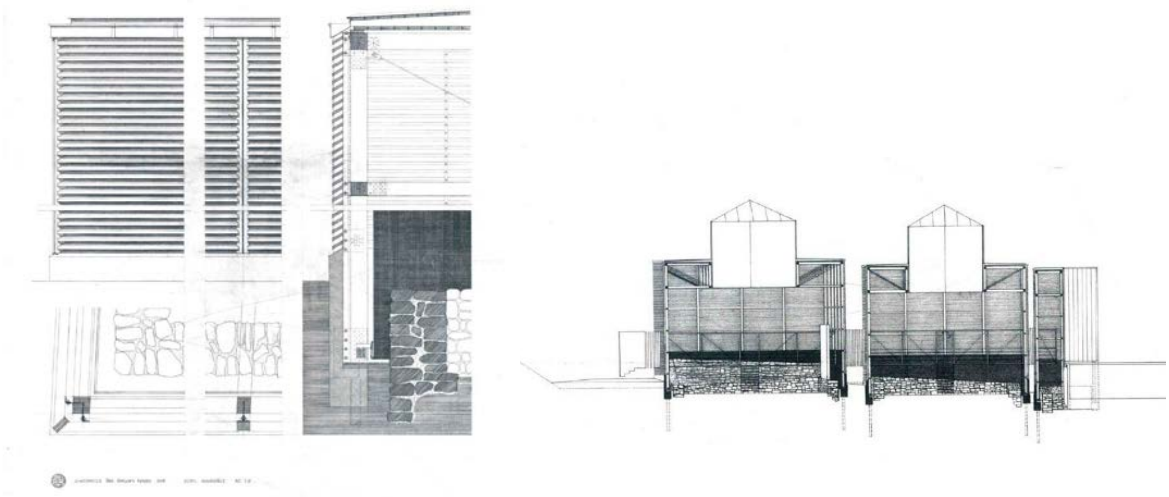

Figure 3. *Material details & section (left), building section (right). Buildings and Projects, Peter Zumthor, Volume 1, Page:38-39 & 42-43.*

VOLUMETRIC COMPOSITION AND ABSTRACTION

One of Zumthor's most radical design decisions in his project in Chur is his refusal to build a massive, monolithic roof or an industrial hangar to cover up archaeological remains. Instead, Zumthor preferred to re-establish the original volumes of Roman structures. Following the traces of the ancient foundations unearthed during the excavations, he determined the exact volumes of the structures that once stood on them, and the new wooden structure rose directly from the foundations' surroundings (Lorentz, 2021). This strategy prevents the remains from being homogenized under a singular roof and transformed into a traditional museum exhibition. On the contrary, Roman structures aim to reintroduce the remains in the urban fabric by preserving their original spatial relations and urban logic, as if they still exist.

This reconstruction act is not the same as the original. On the contrary, it contains a high level of volumetric abstraction. Instead of imitating the stone or brick walls of Roman dwellings, Zumthor abstracted the building's mass through a permeable membrane of wooden lamellas (Figure 4). The resulting form can be defined as an "abstract body" in Zumthor's own words. This abstract body acts as a physical ghost of lost history; It fills the volumetric void left behind by the extinct Roman structures and represents the "missing mass" of the past (Lorentz, 2021).

Externally perceived wooden shells evoke images of rural warehouse structures specific to the region. However, processing wood with a very precise understanding of detailing and its construction, with a logic of mass production approaching an industrial order, turns the structure away from a vernacular expression and transforms it into an abstract architectural object (Lorentz, 2021). The building's design as three separate volumetric boxes also reconstructs the street texture of the Roman period and the gaps between the structures. The permeable surfaces of wooden shutters are directly related to Gottfried Semper's theory of waiting (Figure 5), which positions the origin of architecture in the art of weaving. In this context, the wall is not a carrier mass; It functions as a “clothing” or membrane that filters light and air (Lorentz, 2021; Kocaoğlu, 2011).

Figure 4. *Ruins, Wooden Cladding & Light Well. August Fischer (2018).*

Figure 5. *Display tables (left), cladding close-up (right). August Fischer (2018.)*

ARCHITECTURAL ANALYSIS: THE TECTONICS OF LIGHT

This section focuses on how light, material, and tectonic logic work together as an integrated system by providing a detailed architectural analysis of the Roman Ruins Conservation. Within the scope of the examination, the lamella wall system is considered as a filtration/filtering device; The role of

permeability and aging of the material over time in the formation of the atmosphere is discussed; The pedestrian bridge, on the other hand, is considered as a perceptual interface that configures the visitor experience. Through these components, light is not a secondary or complementary element; An effective architecture that organizes space, perception, and meaning is considered a subject.

ARCHITECTURAL ANALYSIS: THE TECTONICS OF LIGHT AND MATERIAL

At the center of the design developed by Peter Zumthor for the conservation structure of the Roman ruins in Chur is an original facade strategy that transforms the structure into a measured "light filter" by removing it from the role of a leak-proof shell. This strategy can be analyzed through the *Stabwerk* (rod or beam system) logic. Instead of building a massive, opaque wall, Zumthor has constructed a lattice of thin wooden lamellae arranged in layers. This system removes the wall from being a static separator, making it a permeable membrane that allows external atmospheric conditions to leak into the interior. Wooden slats function as architectural “screens” and give the outer surface an almost textile-like quality (Lorentz, 2021). This approach directly aligns with Gottfried Semper's theory of waiting, which situated the origin of architecture in the art of weaving and coating. In this context, wooden lamellas are not a carrier mass; they act as an abstract fabric that surrounds the structural skeleton and filters light (Kocaoğlu, 2011). Thus, the façade is defined as an effective architectural element that mediates between light, material, and atmosphere rather than a structural boundary (Figure 6).

Figure 6. *Museum Exterior. Taken from YouTube Channel Arcdog (2017).*

BETWEEN DIRECT AND DIFFUSED LIGHT

When evaluated within the framework of the typologies defined in the architectural lighting literature, it is seen that the lighting strategy in the building exhibits a hybrid character located between "semi-direct" (semi-direct) and "diffused" lighting. According to light distribution theory, “direct lighting” produces sharp shadows and hard edges by transmitting 90 to 100 percent of the light downward; “General diffused lighting” softens shadows by evenly distributing light in all directions (Kumaş, 2020; Alkan, 2010). In the protection structure in Chur, the wooden lamella system breaks down and filters direct daylight before it enters the interior. While the angles and densities of the lamellas prevent sunlight from hitting archaeological remains directly like a spotlight, they also prevent the uniformity created by completely homogeneous, flat-spilled lighting (Figure 7). The penetration of light through the gaps between the lamellas produces rhythmic, soft, and translucent shadow patterns on the ground and on the surfaces of the remains. While this lighting condition increases visual comfort for visitors, it

provides an ideal "shadow quality" that enhances the readability of three-dimensional forms, such as Roman-period walls (Kumaş, 2020). Thus, light functions not only as an element that illuminates the space, but also as an effective component that strengthens spatial perception and architectural narrative.

Figure 7. *Window on the street level. August Fischer (2018).*

RHYTHM AND SHADOW

This setup, based on the repetition of wooden elements, produces an industrial pattern that evokes the logic of mass production in minimalist structures (Lorentz, 2021). This series repeats a shadow play that constantly changes in the interior as light moves throughout the day. Similar to the understanding that Semper describes as the "touched" element, light makes the skeleton's rhythm and the logic of its joints visible, the art of joining. Beams of light filtering through the lamellae give the inner surface of the structure a "dematerialized reality" appearance. In this context, the wall is no longer perceived as a massive obstacle; On the contrary, it is experienced as a living surface woven from the light itself (Kocaoğlu, 2011).

POROSITY AND THE BREATHING WALL

Contrary to the climate-controlled, context-isolated museum model of modernism, the conservation structure in Chur was designed as a "breathable" structure (Figure 8). The porosity of the wooden bark raises the structure to the quality of an intermediate space. This permeable state is not just light; It also allows wind, urban sounds, smells, and temperature changes to penetrate the interior (Lorentz, 2021). In this way, archaeological remains are preserved in a living atmosphere, not in a sterile vacuum. The visitor inside the building is not completely detached from the outside world. On the contrary, the breeze and sounds filtered through the lamellae establish a sensory continuity with the urban context. This is not only for Juhani Pallasmaa's view of architecture; it is also a concrete example of the approach he defines as the capacity to present a "holistic experience" that appeals to the tactile and auditory senses (as cited in Can, 2018).

Figure 8. *Exterior of the building during night, Breathing Facade. Helene Binet, www.pritzkerprize.com.*

MATERIAL AGING AND MATERIAL MEMORY

The wood used in the building turns gray over time due to natural aging. This conscious choice of material allows the "new" structure, represented by the wooden shell, to visually integrate with the "old" remains of stone foundations over time (Figure 9). This process can be associated with the concept of *utsuroi* in Japanese aesthetic thought, in which material and light trace time in space. With wood transformed by exposure to weather conditions and its surface changes, the structure ceases to be a static object and becomes a body that carries the traces of time. This situation can be defined as a Dionysian union in which deteriorating and permanent materials coexist in the dynamics of nature through the mutual interaction of light and shadow (Erduman, 2000). As Zumthor states, materials remain silent until they interact with light; When illuminated, they produce an atmosphere by revealing their own “glows” (Meyghani, 2019). The slowly changing color of the structure's wood in Chur becomes a constitutive component of this atmospheric condition.

Figure 9. *Aging Timber Turning into Black. Taken from YouTube Channel Arcdog (2017).*

THE PEDESTRIAN BRIDGE AS A PERCEPTUAL INTERFACE

The presence of a metal pedestrian bridge within the conservation structure's internal spatial organization is one of the most critical interventions shaping the space's phenomenological experience (Figure 10). The bridge physically elevates the visitor from the archaeological ground, placing him in the position of an observer. Thanks to this arrangement, which prevents direct contact with the soil, Zumthor establishes a conscious physical distance between the historical layer and the contemporary user, while simultaneously producing a visual and cognitive affinity. The pedestrian bridge functions as a binding element that connects fragmented volumes and guides the visitor along a pre-constructed route (Lorentz, 2021).

Figure 10. *The Bridge inside the Museum. August Fischer (2018).*

CONSTRUCTING THE GAZE

The positioning of the pedestrian bridge and windows is not coincidental; On the contrary, it was determined in line with an eccentric strategy. These elements act as singularities that deliberately interrupt the structure's pure geometry. Through these interventions, Zumthor consciously directs the visitor's gaze. While the windows offer framed views towards the exterior, the movement along the bridge allows the remains to be perceived from different angles. When standing on the bridge, the visitor sees the remains from above as a holistic and valuable object. On the other hand, when descending the stairs and approaching the ground, these objects are purified from their museological distances and become part of a “true experience” of the present moment (Figure 11), (Lorentz, 2021). This dynamic state removes the visitor from a passive viewer and transforms the space into an active subject that physically experiences it. The contrast between the industrial coldness of the metal bridge, the warmth of the wooden bark, and the soil-related texture of the excavation area strengthens the tactile (haptic) quality of the space. Light, on the other hand, functions as an intermediary force in this sensory interaction and establishes a connection between different layers of materials and experience (Meyghani, 2019).

Figure 11. *The Pathway in the Museum. Taken from YouTube Channel Arcdog (2017).*

DISCUSSION: LIGHT AS A CRITIQUE OF MODERN CONSERVATION

The following discussion interprets the Roman Remains Conservation Structure in Chur as a critical response to dominant modern conservation paradigms, particularly those grounded in transparency and visual control. This evaluation, which centers on light as both a phenomenological and ecological factor, considers the project as an alternative model that questions the "glass box" logic of modernism; it also reveals that it offers an approach that anticipates contemporary concerns such as sustainability and passive design.

ESCAPE FROM THE GLASS BOX

During the twentieth century, the elimination of load-bearing walls through steel-and-glass construction, as seen in the works of modernist architects such as Mies van der Rohe, has become synonymous with architectural transparency and visual clarity (Kocaoğlu, 2011). In the context of conservation and display architecture, this tendency has produced the dominant "glass box" typology, in which historical objects are completely isolated from their environment and sealed off in a hermetic manner (Phillips, 2004). Although such spaces ensure visual accessibility and environmental control, they often detach protected objects from their spatial, atmospheric, and temporal contexts.

Peter Zumthor's preservation of the Roman ruins in Chur can be read as a conscious criticism of this Orthodox conservation model. Instead of presenting history as an object to be consumed visually through transparent surfaces, it activates memory through the controlled presence of light, shadow, and material. As Tadao Ando emphasizes, the power of light is most intensely revealed in its relation to darkness. In this context, darkness is not the absence of light; it should be understood as a condition that intensifies perception and endows objects with depth and autonomy (Erduman, 2000).

In the conservation structure in Chur, the daylight that enters through the wooden lamellas produces a semi-dark atmosphere in which the Roman ruins are gradually revealed, not instantaneously and directly. This implicit illumination promotes a careful and focused form of perception by resisting visual consumption. Through the ever-changing interplay of light and shadow, the remains are not static exhibition objects; they are experienced as elements embedded in a temporal process. In contrast to

the uninterrupted transparency of the glass, the filtered light allows the visitor to feel both the texture of the material, the spatial depth, and the passage of time (*Utsuroi*) at the same time (Figure 12), (Erduman, 2000; Lorentz, 2021).

By placing the archaeological remains in an atmosphere shaped by dimness, shadow, and materiality, Zumthor reveals that visibility is not necessarily transparency. On the contrary, partial hiding and controlled lighting can strengthen perceptual clarity and historical reverberation. In this respect, the structure in Chur questions the modernist assumption that conservation requires full visual disclosure and proposes an alternative model in which light operates as a critical and contextual architectural environment.

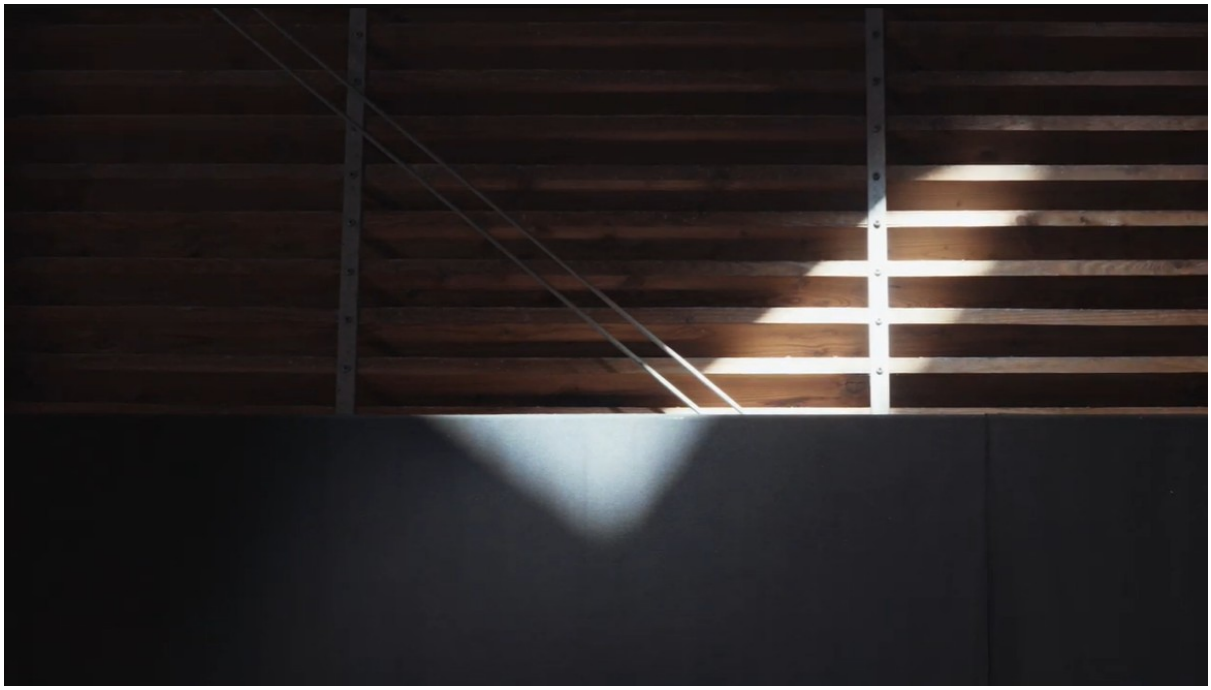

Figure 12. *Daylight hitting the interior wall. Taken from YouTube Channel Arcdog (2017).*

SUSTAINABILITY AND PASSIVE DESIGN

The structure of the Roman ruins in Chur is not only an aesthetic and phenomenological choice; it can also be considered an example of early ecological sensitivity that aligns with contemporary sustainability criteria. Modernist glass boxes often depend on energy-intensive mechanical cooling and artificial lighting systems to address problems such as solar-induced heat gain and glare (Phillips, 2004). In contrast, Zumthor's design eliminates this energy load and integrates passive design principles directly into the structure's tectonic logic.

The most obvious ecological strategy of the structure is based on porosity and natural ventilation. The wood lamella system allows the structure to “breathe” and regulates indoor humidity and temperature without the need for mechanical air conditioning systems (Lorentz, 2021). This permeable shell allows the wind to penetrate the structure, balancing the microclimate of the archaeological site with the external environment and providing natural air circulation necessary for the preservation of the remains.

From a lighting perspective, the structure minimizes electrical energy consumption, relying primarily on daylight. In addition to saving energy, natural light produces invigorating and soothing effects on human biology and psychology that artificial lighting cannot fully replicate (Kumaş, 2020). Wooden

lamellae serve a function like a *brise-soleil*, preventing overheating and visual disturbances caused by direct sunlight while creating a balanced lighting condition in the space (Phillips, 2004). This structure in Chur shows that sustainability does not necessarily depend on high-tech "smart building" systems. On the contrary, ecological performance: the material layout reveals that, through the direction and passive use of natural light, it can be directly derived from the architectural form itself.

CONCLUSION

Peter Zumthor's conservation structure of Roman ruins in Chur reveals how tectonic logic, often considered separately in architectural discourse, can be integrated into the atmospheric experience through a singular architectural strategy. The project is based on a rational, meticulously controlled construction logic, with the repetitive layout of a wooden *stabwerk* system. However, this structural framework is not just a carrier system; It is also used as a tool that shapes light and produces a spatial atmosphere. In this context, Gottfried Semper, who argues that the architectural essence lies not in the bearing wall but in the enclosing surface, finds a contemporary interpretation in the permeable wooden bark of the building. Wooden lamellae function as a spatial membrane that filters the daylight; Thus, light ceases to be a secondary technical addition and becomes a founding architectural element.

Unlike modern conservation approaches, which are sealed and visually insulated in transparent showcases, Zumthor's "breathing wall" shows that it is possible to preserve environmental and temporal conditions without being excluded from space. The permeable shell positions Roman ruins in an effective spatial environment rather than presenting them as static historical objects, allowing daylight, air movement, sound, and subtle atmospheric changes to penetrate the interior. The ever-changing interaction of light and shadow overlaps with the concept of *Utsuroi* in Japanese aesthetic thought, giving the experience of space to the experience of space. The wooden surface's visual approach to the stone persists over time, allowing it to be read as an architectural body that transforms with the building's context.

Through the coordination of light, material, and tectonic expression, this structure in Chur functions as an architectural mechanism that mediates between the past and the present. The project questions the assumption that visibility is necessarily dependent on transparency; It reveals that partial hiding and atmospheric depth can strengthen perception and intensify memory experience. In this respect, Zumthor's design suggests an alternative model for conservation architecture; It is redefining light not only as a means of lighting, but as a critical architectural environment that constructs material existence, spatial meaning, and historical continuity.

ACKNOWLEDGEMENT

This study derives from a part of the master's thesis conducted by Enes Öner at Ankara Yıldırım Beyazıt University, The Graduate School of Natural and Applied Sciences, Department of Architecture, under the supervision of Assistant Professor Dr. Cemile Feyzan Şimşek.

BIBLIOGRAPHY

Alkan, İ. (2010). *A study on the psychological effects of light–shadow relationships in architecture* [Master's thesis].

Arcdog. (2017). *Shelter for Roman ruins by Peter Zumthor* [Video]. YouTube. https://www.youtube.com/watch?v=zQbrQunAWTs

Binet, H. (n.d.). *Shelter for Roman ruins, Chur* [Architectural photograph]. Pritzker Architecture Prize. https://www.pritzkerprize.com

Can, İ. (2018). *A phenomenological evaluation of the concept of "place" in architecture: The case of METU Faculty of Architecture* [Master's thesis]. Eskişehir Osmangazi University.

Çelik, K. (2020). *A sustainable lighting design approach in educational buildings* [Master's thesis].

Erduman, F. (2000). *Dionysian light: A research on light and architecture* [Master's thesis]. Middle East Technical University.

Fischer, A. (2018). *Shelter for Roman ruins, Chur* [Architectural photographs]. Divisare.

Frampton, K. (1996). *Studies in tectonic culture: The poetics of construction in nineteenth and twentieth-century architecture.* MIT Press.

Kocaoğlu, N. (2011). *A Semperian approach to artificial light as a building material* [Master's thesis]. Middle East Technical University.

Kumaş, S. (2020). *Investigation of the effects of natural and artificial light on spatial design in shopping environments: The case of Trabzon Forum AVM* [Master's thesis]. Avrasya University.

Lorentz, R. D. C. (2021). *Teaching architecture: Peter Zumthor and the foundations of composition* [Doctoral dissertation]. Università Iuav di Venezia.

Mallgrave, H. F. (2006). *Architectural theory: Volume 1, an anthology from Vitruvius to 1870.* Blackwell Publishing.

Meyghani, R. (2019). *Decoding of Zumthor's design process* [Master's thesis]. Anhalt University of Applied Sciences.

Parramon Verdú, M. (2025). *La fusta en l'obra de Peter Zumthor al Cantó dels Grisons* (Treball Final de Grau, Escola Tècnica Superior d'Arquitectura de Barcelona, Universitat Politècnica de Catalunya).

Phillips, D. (2004). *Daylighting: Natural light in architecture.* Architectural Press.

Semper, G. (1851/1989). *The four elements of architecture and other writings.* Cambridge University Press.

Zumthor, P. (2014). *Peter Zumthor: Buildings and projects, 1979–1997* (Vol. 1, T. Durisch, Ed.). Scheidegger & Spiess.

Zumthor, P., & Fischer, A. (n.d.). *Caplutta Sogn Benedetg* [Architectural project documentation]. Divisare. https://divisare.com