

Spatial memory in the transformation of industrial buildings into cultural spaces: CerModern

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Abstract:

This study investigates how spatial memory is sustained through interior atmosphere in the process of adaptively reusing industrial buildings as cultural venues. Taking CerModern in Ankara – an architectural transformation of the former Railway Maintenance Workshops into a contemporary exhibition centre – as a case study, the research conceptualises this transformation not merely as a functional change but as a perceptual process in which industrial traces are reinterpreted within current cultural use. Adopting a qualitative and interpretive case study design, the study focuses on how light, colour, materials, and exhibition elements shape the interior atmosphere and support the continuity of spatial memory. The control of natural light, integration of artificial lighting, preservation of the original material and neutral colour palette, and use of temporary exhibition elements were identified as key design strategies for maintaining its industrial identity. Based on these criteria, CerModern was evaluated as a successful adaptive reuse project that accommodates contemporary functions while preserving its original fabric, spatial memory, and holistic atmosphere. Exhibition components are interpreted as flexible instruments that guide visitor flow and generate spatial zoning without creating permanent physical barriers. Overall, the CerModern case demonstrates that an atmosphere produced through the coordinated use of lighting, materials, colour, and exhibition systems can function as a bridge between past and present, helping to render industrial heritage experientially recognisable while adapting it to contemporary cultural programs.

Keywords:

spatial memory, industrial heritage, interior atmosphere, transformation, CerModern

1. Introduction

Due to changes in industrial production methods driven by globalisation, cities have undergone spatial transformations. Inner-city industrial zones have lost their function and have either been moved outside the city or demolished [1]. These abandoned industrial zones are described as “lost areas.” These lost areas disrupt the continuity and pedestrian circulation in the city, harming the urban order. In fact, these areas have significant potential to both revitalise city centres and limit urban sprawl [2]. This is because a city's sustainability is achieved through spatial transformations shaped by historical, cultural, and social values. In this context, it is necessary to reintegrate these lost spaces into social life to preserve the city's identity [3]. The architectural structures bear traces of the past and belong to specific historical periods. They hold a significant place in the history and collective memory of the city in which they are located. Adapting these structures to the present day while preserving their spatial memory enhances the cultural and historical value of the intervention. Therefore, repurposing and reusing these structures is not only about physical preservation but also about preventing the erasure of cultural memory. It helps build a bridge between the past and the future [4].

Contemporary museums and art centres play a key role in the adaptive reuse approach. They have transcended the boundaries of functions such as preservation and exhibition; they have transformed into environments for social communication, interaction, and learning. Society's involvement in the process helps transmit cultural heritage to future generations [5]. Industrial buildings, formed by disciplines such as engineering, architecture, and urban planning, possess monumental qualities. These structures are considered not only tangible heritage but also “intangible heritage” due to their social and emotional value. Through these values, they continue to carry the spirit of the place. This is the spiritual dimension of the matter [6,7]. The interior of a building is even more critical to preserving the place's spirit, as it carries both tangible and intangible values. While the exterior design expresses the building's form, the interior represents lifestyle, cultural identity, function, spatial context, and social interaction. Therefore, adaptable approaches to reusing interior spaces should be preferred to preserve and sustain heritage. This will enable intergenerational transmission [8].

2. Spatial memory and transformation in the context of industrial heritage

2.1. The concept and transformation of the industrial heritage

Industrial heritage encompasses the buildings, infrastructure, spatial arrangements, and associated values that reflect earlier systems of industrial production. Such structures should not be evaluated merely as former places of production. They also represent layers of urban history and collective memory that contribute to the formation of urban identity.

Once industrial activity ends, these sites may become part of what Trancik (1991) describes as “lost spaces.” Their abandonment can weaken urban continuity and pedestrian connections, particularly when they occupy large and centrally located areas. Nevertheless, their scale, architectural character, and location give them considerable potential for reuse. Reintegrating these sites into the urban fabric can therefore transform areas of disconnection into active components of contemporary city life [2].

In Ankara, the Cer Workshops represent the industrial landscape of the early Republican period, during which railway infrastructure played an important role in shaping the city’s spatial development. Formed through the intersection of engineering, architecture, and urban planning, these structures possess historical and monumental value. Their significance, however, is not limited to their physical fabric. They also embody social meanings, emotional associations, and collective memories connected with Ankara’s modernisation. According to ICOMOS (2011) principles, the conservation of such sites is essential not only for physical sustainability but also for maintaining the ‘spirit of the place’ (genius loci), which serves as a spiritual link between the past and the present [6].

The adaptive reuse of industrial buildings involves introducing a new function while retaining and reinterpreting the heritage values embedded in the existing structure. It therefore extends beyond physical renovation. The process redefines the building’s role within the urban fabric and establishes a new relationship between its industrial past and contemporary use.

The primary challenge is to accommodate new spatial and functional requirements without obscuring the building’s historical attributes. This does not necessarily require the new interventions to imitate the original structure. Rather, contemporary additions should remain legible while respecting the scale, material character, and spatial logic of the existing building. Such an approach creates a dialogue between the old and the new and enables the industrial fabric to remain perceptible after the functional transformation.

The conversion of industrial structures into museums and art centres is especially relevant in this regard. Contemporary cultural spaces are no longer limited to the preservation and exhibition of objects; they also support public participation, social interaction, communication, and learning. By bringing users into direct contact with industrial heritage, these functions contribute to the transmission of cultural values across generations. The transformed building thus becomes neither a frozen remnant of the past nor an entirely new environment detached from its history. Instead, it operates as a living component of contemporary urban and cultural life.

2.2. The relationship between spatial memory and atmosphere

Spatial memory and interior atmosphere represent related but distinct dimensions of the adaptive reuse of industrial buildings. Spatial memory refers to how previous functions, meanings, and

associations remain embedded in the physical, material, and spatial organisation of a building. Interior atmosphere, in turn, describes the overall spatial character generated through the interaction of lighting, materiality, colour, texture, scale, proportion, and spatial configuration. In adaptive reuse, the relationship between these two dimensions is important because the interior atmosphere can maintain the legibility of the building’s historical identity while accommodating a contemporary function.

Industrial interiors are often characterised by functional spatial arrangements and a restrained material language. Existing features such as exposed structural elements, concrete surfaces, metal components, large openings, and neutral colour palettes may therefore act as physical carriers of spatial memory. Preserving these features does not require the interior to remain unchanged; rather, spatial continuity can be maintained by integrating contemporary interventions with the material and architectural character of the existing structure. When the original and newly introduced elements establish a coherent relationship, the building’s former identity remains legible despite its functional transformation.

As Pallasmaa argues, colour and material influence not only the visual identity of an environment but also the user’s experiential relationship with it [9]. When these components retain meaningful traces of the building’s industrial past, users can recognise its former identity while experiencing its contemporary cultural function. The interior atmosphere thus becomes the experiential expression of the relationship between industrial heritage, spatial memory, and adaptive reuse.

2.3. Spatial experience and perception in industrial transformation

Whereas the preceding section focuses on the material and spatial continuity of industrial heritage, this section considers the theoretical sensory and perceptual dimensions of transformation. Adaptive reuse changes not only the physical organisation of a building but also the potential ways in which the relationship between its former and contemporary functions may be interpreted. By bringing historic fabric into dialogue with contemporary interventions, the transformation of industrial buildings into cultural spaces can create a distinctive atmosphere in which the old and the new coexist [10].

In this context, genius loci, or the spirit of place, is particularly important in transforming industrial buildings into cultural spaces because it encompasses the tangible and intangible values that sustain spatial memory, identity, and atmosphere. Rather than residing solely in the physical fabric, the spirit of place emerges through the relationship between people and their environment; accordingly, users experience it through multisensory interactions involving sight, hearing, touch, smell, and, where relevant, taste.

Visual perception provides a particularly important framework for evaluating spatial transformation because a substantial part of users’ interaction with their environment is visual. Operating at both physical and emotional levels, visual perception shapes spatial experience through design components such as light and shadow, colour, texture, material, form, scale, and proportion; consequently, the organisation of these components influences how users perceive, interpret, and experience a transformed space [11].

3. CerModern as an adaptive reuse project

CerModern's transformation should be evaluated by considering its historical and urban context. The Cer Workshops are located within Ankara's early-Republican industrial landscape, where railway infrastructure played a significant role in shaping the city's spatial development. Industrial heritage buildings are addressed not only as physical spaces of production but also as reflections of multilayered urban memory, thereby contributing to the formation of urban identity [12]. In this respect, the adaptive reuse of industrial structures for cultural functions is regarded as an important tool for reconfiguring the urban context [13].

The Cer Workshops embody characteristics of early modern industrial architecture alongside the modernisation ideals of the early Republican period. The building's material usage is function-oriented, while its spatial organisation is primarily based on production processes. The adaptive reuse of the Cer Workshops as a cultural space does not aim to eliminate the historical structure; rather, it focuses on reinterpreting the existing fabric to suit contemporary use, thereby contributing to cultural and social life. In this sense, CerModern can be considered an example of adaptive reuse that balances physical continuity with the preservation of cultural memory.

3.1. Historical background of CerModern

CerModern is closely associated with Ankara's industrialisation and modernisation during the early Republican period. The Cer Workshops were constructed as a production-

oriented industrial facility at a time when railway infrastructure played a significant role in the city's spatial development. Industrial buildings of the early Republican era were characterised by an architectural approach that prioritised functionality, rational planning, and technical requirements. In this context, the Cer Workshops can be considered not only as spaces of production but also as structures that spatially reflected the economic and social transformation of the period.

The historical identity of the Cer Workshops can be interpreted through their material use, wide spans, large volumes, and spatial organisation based on production processes. Although this spatial configuration, which served industrial production, lost its original function over time, the building has preserved its physical presence and has become an important component of urban memory (Fig. 1 and Fig. 2). In this respect, the structure is regarded as a carrier of multilayered urban memory [14]. The pre-transformation condition of the Cer Workshops clearly reveals the production-oriented spatial organisation, structural spans, and material characteristics specific to industrial architecture. The preservation of the Cer Workshops to the present day allows the building to be interpreted not merely as a remnant of the past, but as a representative example of Ankara's industrial heritage. This historical background provides a fundamental basis for understanding the transformation of CerModern into a cultural space.



Fig. 1. Pre-transformation of the Cer Workshops prior to cultural reuse



Fig. 2. Pre-transformation of the Cer Workshops prior to cultural reuse

3.2. Transformation into a cultural space

The transformation of the Cer Workshops into a cultural space is examined within the framework of adaptive reuse approaches aimed at the conservation of industrial heritage. The primary objective of this process is to integrate contemporary cultural functions with the building's existing industrial character without eliminating its historical attributes. This approach involves not only a physical change of function but also the reconfiguration of the building's meaning within the urban context [15].

In the case of CerModern, the transformation process was carried out through an approach that preserves the legibility of spatial traces associated with the building's industrial past.

Industrial architectural elements characteristic of the Cer Workshops, such as large volumes, structural spans, and material expression, were adapted to new cultural functions while maintaining spatial continuity. This strategy allows the relationship between the old and the new to be established through spatial dialogue rather than sharp contrast [16]. The new spatial configuration that emerged because of CerModern's transformation into a cultural space clearly demonstrates the adaptive reuse approach aimed at preserving industrial structures while opening them to public use (Fig. 3). In this respect, CerModern can be considered an example that maintains a balance between historical identity and contemporary use in the transformation of an industrial production facility into a public cultural space.



Fig. 3. General View of CerModern After Adaptive Reuse

4. Methodology

4.1. Research design: qualitative and interpretive approach

The aim of this study is to examine the impact of interior atmosphere on spatial memory in the transformation of an industrial building into a cultural space. In this context, CerModern, a significant industrial heritage site in Ankara currently used as an art gallery, will be examined. The study will focus on the role of light, colour, materials, and exhibition elements in shaping CerModern's interior atmosphere. Within the scope of the study, spatial experience will be evaluated through the transformation of CerModern in line with its spatial memory and new function.

This study adopts a qualitative approach to analyse the mechanisms by which spatial memory is preserved during the adaptive reuse of industrial buildings into culturally served buildings. The starting hypothesis of this study is that the transformation of the buildings, which have an industrial background, and the components such as light, colour, material, and exhibition features, hold spatial memory rather than a physical barrier.

In these circumstances, multilayered and complex spatial experiences cannot be measured with statistical or numerical data. Therefore, this research utilises a case study methodology to investigate these multifaceted spatial dynamics. A case study approach directly connects with the aim of the study in terms of analysing the space in perceptual and physical manners with the spatial atmosphere.

4.2. Case study selection

CerModern was selected as a case study because it represents a seminal precedent for an industrial production facility transformed into a cultural venue while retaining its spatial characteristics and spatial memory. CerModern, in Ankara, is

one of the crucial examples of adaptive reuse projects. Where the railway workshops with a maintenance hangar transform into a contemporary exhibition centre [17].

In the transformation process of CerModern, the preservation of structural elements, broad openings, and industrial spatial organisations is important for spatial memory and for preserving historical traces. The building is also known as a bridge between the past and the present. This state aligns with the ICOMOS principles regarding the conservation of industrial heritage sites, structures, areas, and landscapes [6].

The use of lighting in the interior spaces, the original industrial material usage, and the integrated exhibition elements link the past usage and current usage of the building. This strategy confirms that CerModern is one of the few examples in terms of place, space, and spatiality, which are concepts that should be evaluated with a contemporary exhibition area.

In conclusion, CerModern has been selected as a suitable case study for analysing colour, material, light, and exhibition elements in relation to spatial memory and interior atmosphere. Additionally, the architectural and spatial specifications are investigated under various disciplines such as architecture and engineering, ensuring a solid literature review and analytical framework [18].

4.3. Data collection methods

In this study, the data-gathering process was conducted by a multilayered methodological approach. Literature review, spatial observation, and visual examination approaches were beneficial for examining CerModern. In the first phase of the study, academic sources on historical heritage, adaptive reuse, and articles and publications about CerModern are examined. The literature review creates a framework for the building's adaptive reuse process, architectural characteristics, and historical traces. In this regard, research on the adaptive reuse of

CerModern is discussed, and the building's previous industrial era is interpreted [1,17]. Also, international principles regarding the conservation of industrial heritage sites and structures provide a broader conceptual framework for CerModern [6].

In the second phase of the data-gathering process, a site visit is conducted at CerModern to conduct spatial observations. During this phase, users' spatial axes, spatial organisation, spatial dimensions, and user behaviours were observed. Spatial

observations prepared data for evaluating the outcomes from the literature review. During on-site observation, design factors such as lighting, colour, and material choices were examined in relation to spatial organisation. In Fig. 4, the personal observation notes with the diagram are shown, and in Figs 5-8, personal on-site photos are illustrated. This strategy provides a study for comprehending the industrial building and its transformation to CerModern [17,18].

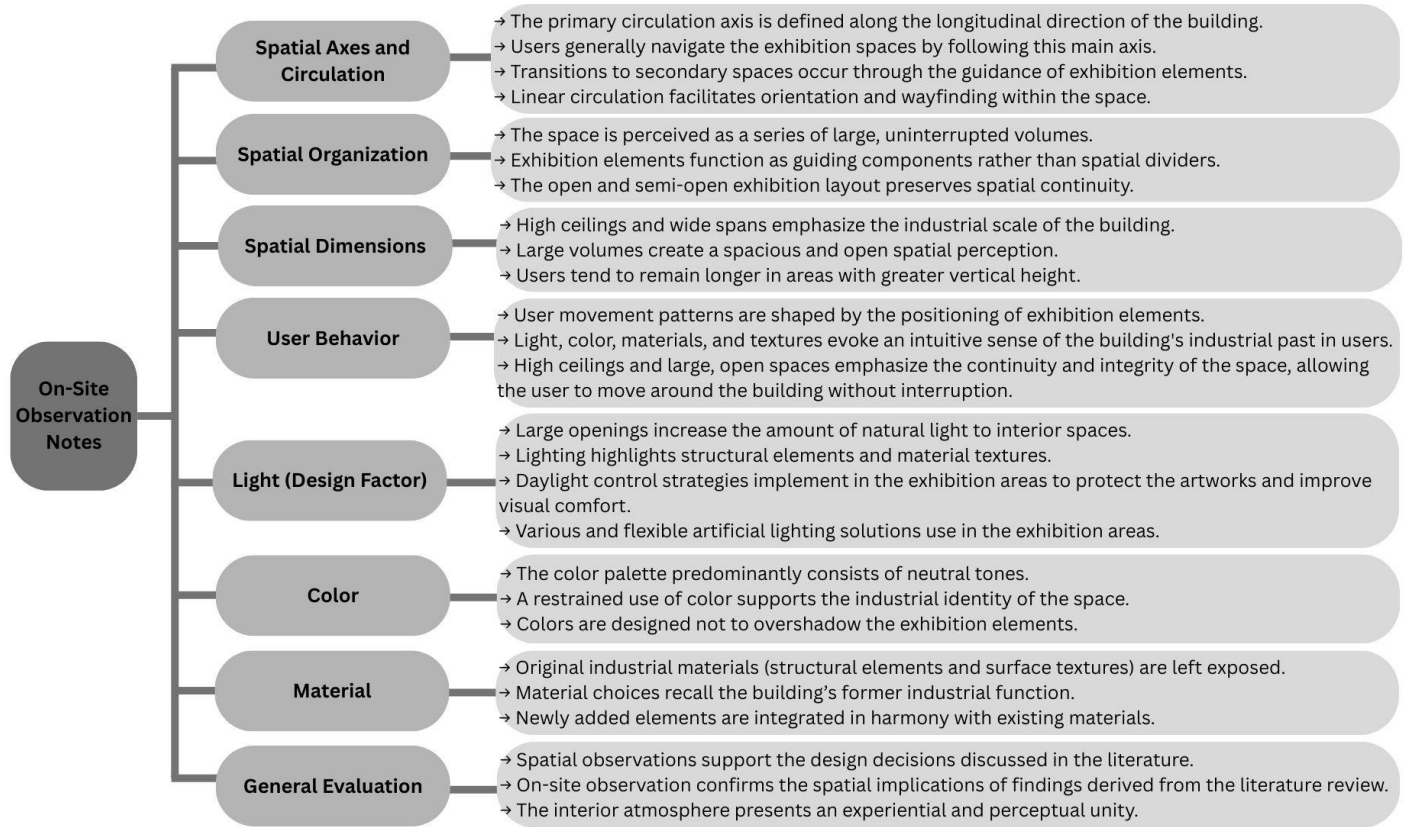


Fig. 4. Personal Observation Notes with the Diagram from CerModern (Prepared by Authors)



Fig. 5. Interior Perspective: Concrete exhibition units and structural elements, an open ceiling, and pendant lighting elements (Author's Archive)



Fig. 6. Exterior Perspective: Stage and seating area (Author's Archive)



Fig. 7. Interior Perspective / Hub Maker Space: Concrete structural elements, ceiling-mounted lighting elements, small production tools, and workbenches (Author's Archive)

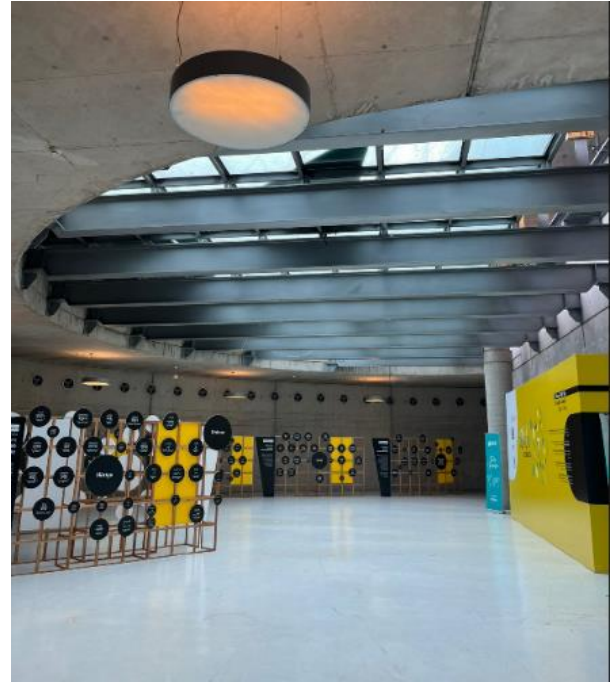


Fig. 8. Interior Perspective / Basement Floor Exhibition Area: Low and exposed concrete ceiling, steel beams and large skylight in the ceiling, circular concrete column, round openings in the walls, modular panels suitable for photo and graphic exhibitions, and pendant lighting elements (Author's Archive)

In the last phase of the study, visual reading of space was carried out by plans and sections, photos, and the exhibition organisation. In this phase, structural elements and interior design decisions for the current and previous uses were examined. In plan and section analysis, the visible structural elements, circulation axes, and exhibition element layouts were

interpreted. The photos are referenced for the adaptive-reuse interventions and design decisions in transforming the space and adding new meaning. Additionally, the layout of the exhibition elements in space evaluated a primary design choice to examine spatial experience. [Figures 9-10](#) and [Figures 11-12](#) illustrate the plan and section drawings.

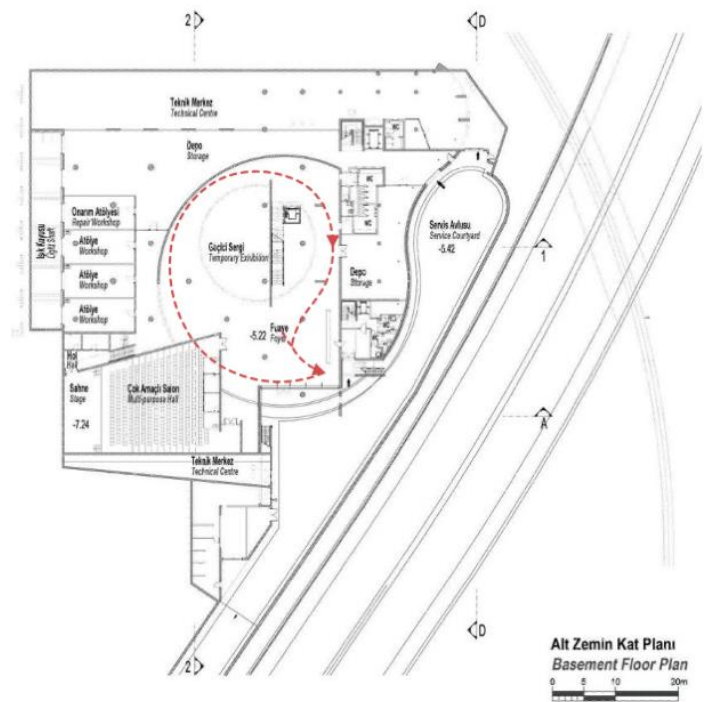
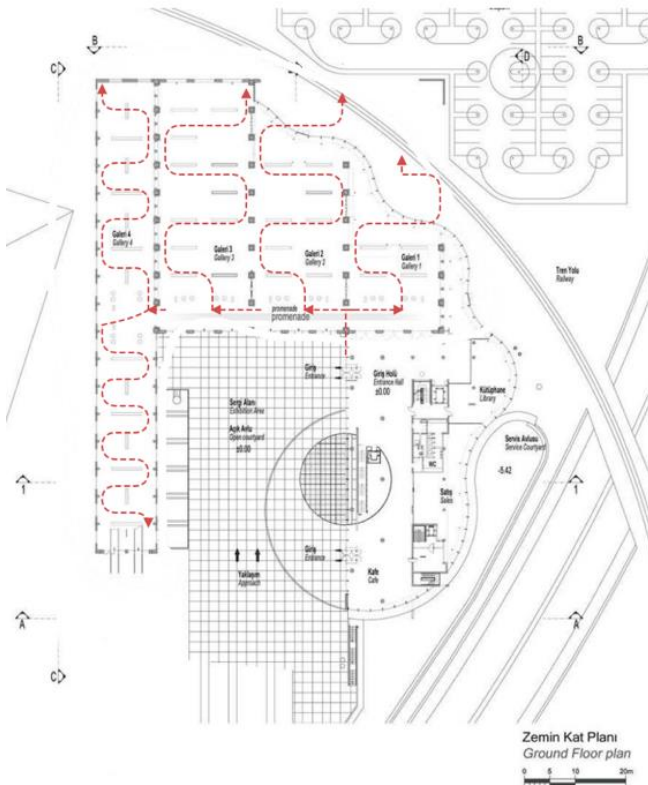


Fig. 9, 10. Plan and Section Drawings of CerModern (not to scale) (URL-1) [30]

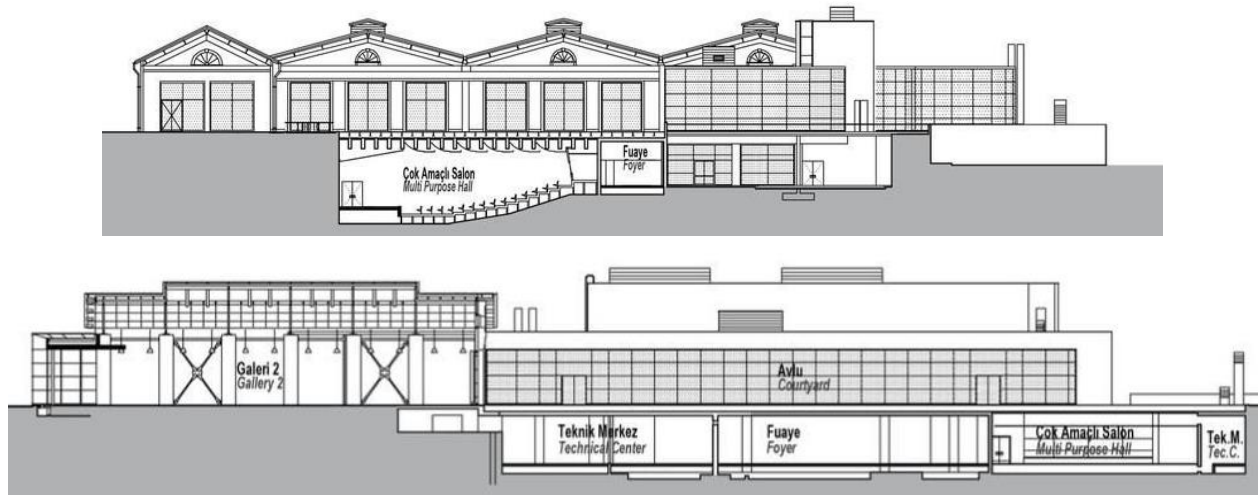


Fig. 11, 12. Plan and Section Drawings of CerModern (not to scale) (URL-1) [30]

5. Analysis of spatial memory and interior atmosphere in CerModern

This section focuses on the analytical evaluation of spatial memory and interior atmosphere that emerged because of CerModern's adaptive reuse process. The transformation of the Cer Workshops, originally an industrial production facility, into a cultural space represents not only a functional change but also a multilayered process in which past spatial traces are reinterpreted in a contemporary context. In this respect, spatial memory is considered a key concept for understanding how the building's physical and perceptual traces can be read through visual legibility [19].

The interior atmosphere is a perceptual whole formed by the interaction of design components such as colour, material, lighting, and spatial configuration. The formation of spatial atmosphere is shaped not only by physical environmental characteristics but also by how users perceive and experience space [20]. In the case of CerModern, these components have been incorporated into the spatial experience through reinterpretation and updating, rather than through the complete removal of the former industrial identity. Accordingly, this section analyses the interior atmosphere of CerModern in relation to the continuity of spatial memory, the legibility of industrial identity, and user perception.

5.1. The Influence of light on spatial atmosphere

In repurposing industrial buildings for cultural heritage, preserving their historical value is as important as maintaining their atmosphere. Atmosphere plays a significant role in conveying spatial memory to the present day. Visual characteristics such as lighting, colour, texture, material, and form shape the atmosphere and create visual perception. Especially in cultural buildings, light becomes more than just a technical element; it transforms into a tool that supports the narrative of the space and the exhibition. During the transition from the railway workshops to CerModern, the technical infrastructure was completely renewed and adapted to its new function. To preserve spatial memory, the existing natural lighting setup was not replaced but supplemented with artificial lighting solutions suitable for an art gallery. The interventions were meticulously adapted to preserve the historical atmosphere.

Industrial buildings have large openings that allow maximum natural light in. However, when these structures are repurposed and transformed into cultural buildings, the amount

of natural light can damage the exhibited works and disturb visitors. Therefore, it is necessary to allow natural light into the interior in a controlled manner. The Railway Workshops also had large doors for bringing in train carriages. With the re-adaptation of the structure, these doors have been transformed into large windows. While these openings originated from the old building's form and function, in the new version, they have become architectural elements that enrich the visitor experience. The roof openings and small windows continue to serve their original function. However, some interventions have been made to these openings, especially in the exhibition areas, for visual comfort and to protect the works. Curtains are used in some parts of the galleries to prevent direct sunlight. The lighting is adjusted according to the exhibited work and the exhibition atmosphere. At this point, temporary solutions are applied rather than architectural interventions. In addition, the mobile exhibition units in CerModern are also used to control the lighting. Exhibition elements are planned to create visual comfort for the visitor. Figure 13 shows the temporary interventions applied.

CerModern features a glass wall extending from its west facade to its southeast facade, facing the railway line behind it and connecting the annex building to the existing buildings. This glass wall, located in the main exhibition space, adds a characteristic feature to the space. It increases the interior light level, helping create a more spacious, open perception. The glass wall continues at the top, creating an opening in the building's ceiling. This design achieves lighting that emphasises the building's architectural features and materials. Sunshades are used to control sunlight. Although these elements run the full length, they cannot completely block direct sunlight due to the building's location. Figure 14 shows the sunshades used to block natural light entering through the glass wall.

Natural light creates a high level of illumination in a space. However, the same efficiency cannot be obtained from daylight at every hour and in every season. Therefore, natural light is supplemented by artificial lighting systems. In exhibition halls, pendant lights and two types of spot lighting are used. The artificial lighting fixtures used are shown in Fig. 15. Pendant lights provide general lighting for the space. Spotlights are used to illuminate the artworks. Flexible use is enabled by column-mounted spotlights with adjustable heads, which highlight 2D and 3D artworks. There is a reflective surface at the top of the spotlight. When indirect lighting is desired, the spotlight is turned towards this surface. The other type of spotlighting is mounted on electrical trays in the ceiling. It is generally used for displaying 2D artworks. It also adds visual richness to the exhibition as a wall washer.

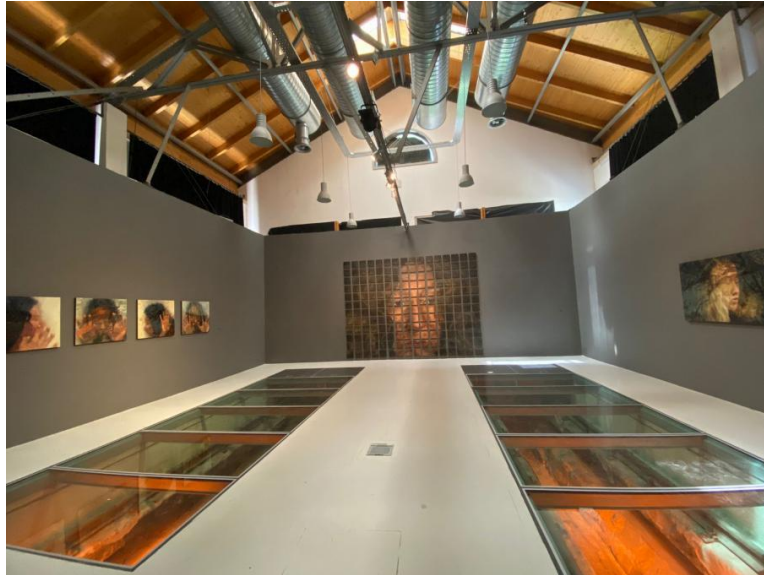


Fig. 13. Temporary Interventions to Block Natural Light (Authors' Archive)



Fig. 14. Glass Wall and Sunshades in the Main Gallery (Authors' Archive)

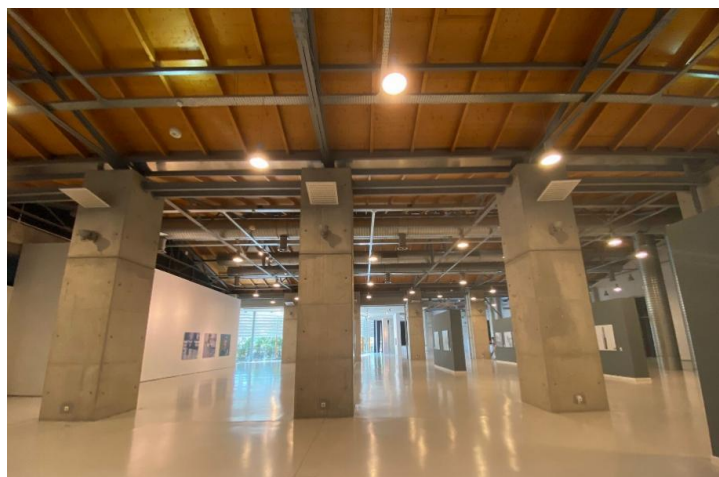


Fig. 15. Artificial Lighting Fixtures Used in the CerModern Gallery Section (Authors' Archive)

The annex building's facade facing the courtyard is designed entirely of glass. This section houses areas such as the reception, cafe, and gift shop. The glass facade allows natural light to enter while also enabling visitors to connect with the outdoors. Natural lighting for the annexe is provided not only by side windows but also by a glass ceiling on the first basement floor. This area, used as a foyer and exhibition space, has been transformed into a dynamic space thanks to natural light. The glass ceiling of the basement floor forms the glass floor of the courtyard, creating

a strong connection between the interior and exterior. Exhibited works are also highlighted by lighting elements placed on the floor. Pendant lights are used on the ceiling to support the general lighting. An attractive space has been achieved through the combination of natural and artificial light. Figure 16 emphasises the combined use of natural and artificial light. The workshops located in the basement also benefit from natural light through light wells. Figure 17 shows the light wells used to illuminate the workshops.

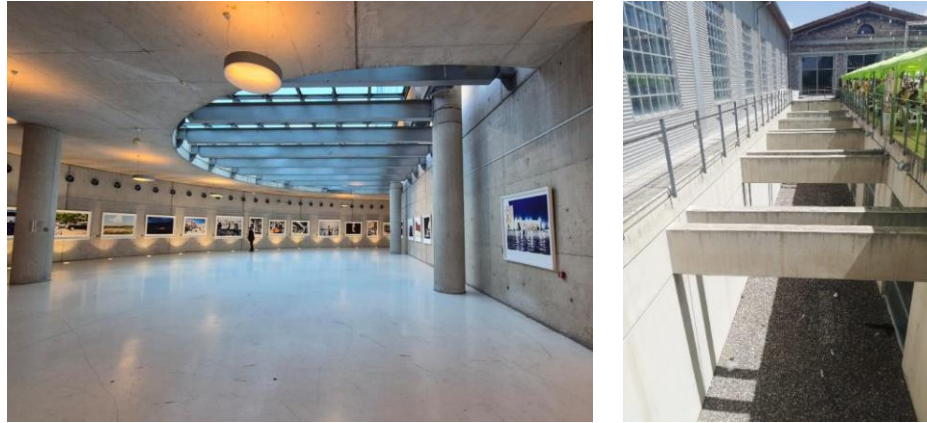


Fig. 16, 17. The foyer area in the basement floor, light wells. (Authors' Archive)

5.2. Reading industrial identity through colour and material

Colour and material play a decisive role in the formation of spatial identity and in the perception of traces from the past. In industrial spaces, material use is grounded in functionality, simplicity, and structural necessity. This approach contributes to the development of a rational, production-oriented spatial language rather than an ornament-based aesthetic, thereby strengthening the legibility of industrial identity [21]. In adaptive reuse processes, preserving this material character is considered a fundamental factor that supports not only physical continuity but also the continuity of spatial memory [22].

In the case of CerModern, the legibility of industrial identity through colour and material has been achieved by consciously exposing existing material colours, textures, and surface qualities. Exposed concrete surfaces, raw metal elements, the visible structural system, and the neutral colour palette preferred across large surfaces create a spatial background that references the building's production-oriented past. These neutral tones (such as grey, anthracite, and natural concrete hues) emphasise the materiality of surfaces while simultaneously revealing the historical layers of the structure. Thus, colour functions not as a decorative element but as a medium that highlights the inherent character of the existing materials.

New design interventions were configured in deliberate harmony with this existing colour and material identity. Strong contrasts were avoided in the added elements; instead of establishing a dominant colour language, a restrained approach was adopted to support the existing industrial atmosphere. This strategy produced a spatial composition that frames and enhances the legibility of the historical structure rather than competing with it. Consequently, a visual hierarchy was established between the old and the new, with the historical layer preserved as the primary focal point.

Colour and material influence not only the visual identity of the space but also users' spatial experience and perceptual orientation. The perceptual continuity created by surfaces, textures, and neutral tones associated with industrial character

enables users to mentally reconstruct the space's former function. In this way, spatial memory is transmitted not only at an informational level but also at an experiential level. As Pallasmaa emphasises, atmosphere is not merely a visual phenomenon; it generates a multisensory experience through the tactile associations of surfaces and the material reality of construction [23]. In CerModern, the coldness of raw concrete, the hardness of metal surfaces, and the calmness of neutral tones evoke an intuitive perception of the building's industrial past.

Furthermore, the neutral colour palette assumes a functional role within the exhibition context. For artworks to stand out, the background must remain visually restrained, with a controlled and balanced use of colour. In this respect, colour assumes a dual function: it both makes industrial identity visible and supports the perception of exhibited works. Thus, the spatial atmosphere produces a holistic experience through historical references, materiality, and a controlled chromatic strategy. Within this framework, Figs 18, 19, and 20 demonstrate that the use of colour and material plays a decisive role not only in preserving spatial memory but also in shaping interior atmosphere and guiding visual legibility. As shown in Fig. 18, the preserved timber roof and exposed steel structural system remain visually legible within the neutral composition created by the white walls and grey flooring. The visibility of these components allows the building's original industrial character to coexist with the requirements of its contemporary exhibition function. Figure 19 demonstrates how the contemporary mechanical systems were incorporated without concealing the existing structural framework. Although the galvanised ventilation ducts are visually prominent, their exposed material character and alignment with the rhythm of the steel roof structure establish continuity between the historical fabric and the contemporary intervention. As illustrated in Fig. 20, the exposed concrete surfaces, grey steel elements, and restrained colour palette form a neutral background for the exhibition. The contrast between this chromatically controlled setting and the orange installation heightens the artwork's visual prominence without diminishing the material character of the architectural space.



Fig. 18. Reading industrial identity through the use of colour and material in the CerModern (URL-2) [31]

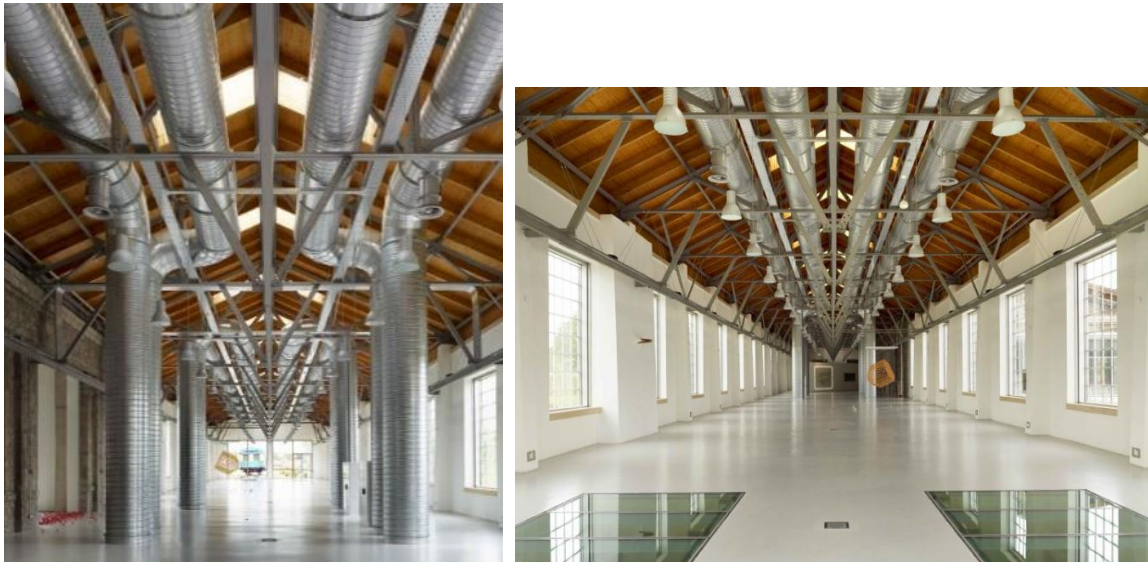


Fig. 19, 20 Reading industrial identity through the use of colour and material in the CerModern (URL-2) [31]

5.3. Contribution of exhibition elements to spatial experience

The components in exhibition areas are evaluated as a design tool that leads spatial experience and organisation, shapes the user behaviour and circulation, and affects spatial perception rather than being only a presentation plane. Also, in literature, it is stated that exhibition components can influence the design of the space within the user-space connection and circulation axes [24]. In Fig. 21, an illustration of the role of exhibition components and the effects on spatial orientation and visitor flow is shown.

In contemporary exhibition spaces, exhibition elements provide spatial orientation, guide conscious visitor flow, and create more easily perceived spatial zones. This creates an orientation in space without a physical barrier, provides a flexible partition throughout the space, and gives users an opportunity to experience the space intuitively [26,27].

In global examples of transforming industrial buildings into exhibition spaces, the exhibition elements serve as the threshold between architectural elements and visual legibility. In this context, “Tate Modern” plays an important role in literature, for

example, as a frequently cited case, also known as the transformation of a power plant into a contemporary museum. With the exhibition elements, the high ceiling structure can be partitioned into the desired temporary spaces and guide the visitor flow [28]. Figures 22 and 23 are an illustration of Tate Modern, an example of an industrial building transformed into an exhibition space. Through this approach, the industrial traces and structural components of the buildings were preserved, while the temporary display systems synchronised the visitor experience with contemporary cultural programs. In adaptive reuse projects, exhibition elements play a managing role in spatial scale and spatial atmosphere. With a connection with light, colour, and architectural elements, exhibition components are strengthening the experiential and sensory means [23,27].

The exhibition components in CerModern are guidelines for dividing a high-volume building, spatial zoning, and providing a visitor flow. In CerModern, exhibition elements are temporary to adapt the space for different exhibitions (Figs 24-27). With temporary portions of these elements, the industrial traces of the past use and the present use as a contemporary exhibition are combined [1,17].

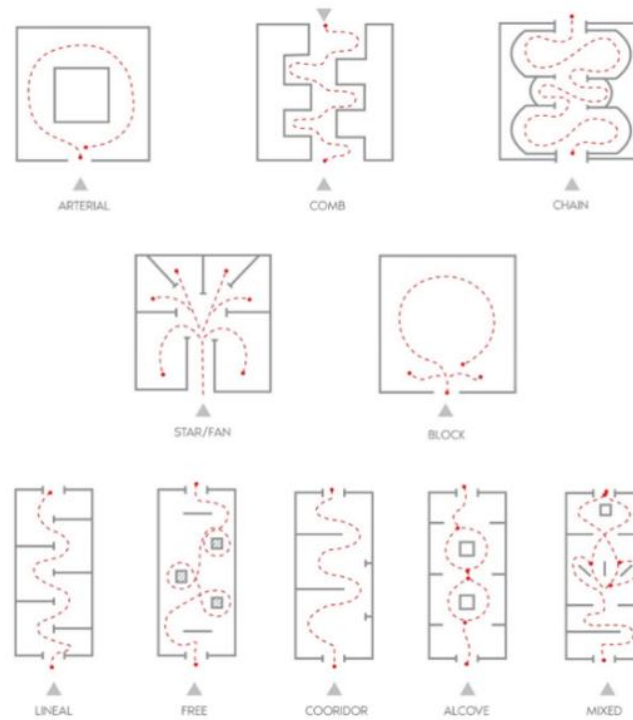


Fig. 21. The role of exhibition components and the effects on spatial orientation and visitor flow [25]



Fig. 22, 23. An illustration of Tate Modern; an example of industrial building transformed into exhibition space: Dominique Gonzalez-Foerster: TH.2058, Rachel Whiteread: Embankment (Tate) (URL-3 [32], URL-4 [33])

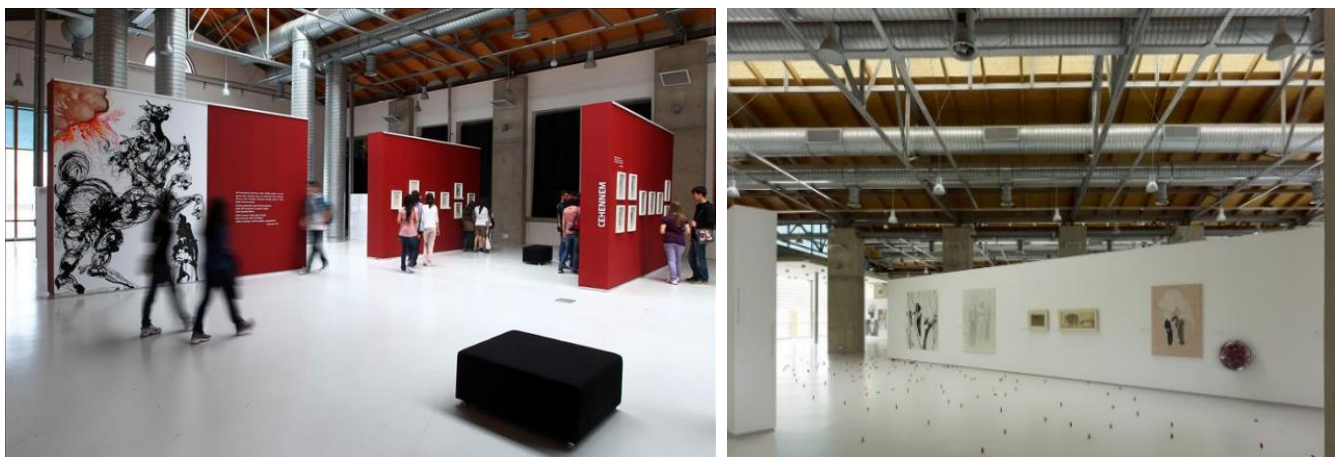


Fig. 24, 25. The positioning of exhibition elements guiding the spatial organisation. (URL-5 [34], URL-6 [35], URL-7 [36], and URL-8 [37])



Fig. 26, 27. The positioning of exhibition elements guiding the spatial organisation (URL-5 [34], URL-6 [35], URL-7 [36], and URL-8 [37])

At CerModern, the structural elements are related to exhibition elements (Figs 28-30). In Fig. 27, the connection with the exhibition element and truss system is examined; the trace of industrial construction is easily recognised. In Fig. 28, exhibition elements are supported to the ceiling with an addition to avoid damage to the masonry wall behind. In Fig. 29, exhibition elements are considered with wall and ceiling elements. With

newly added structural elements and exhibition components working simultaneously, that spatial memory is preserved [18]. In this context, exhibition components in CerModern are evaluated as a guide in visitor flow, making visible the spatial memory and an engaged spatial figure rather than only a stand. It is stated that in spatial atmospheres, exhibition components play a significant role.

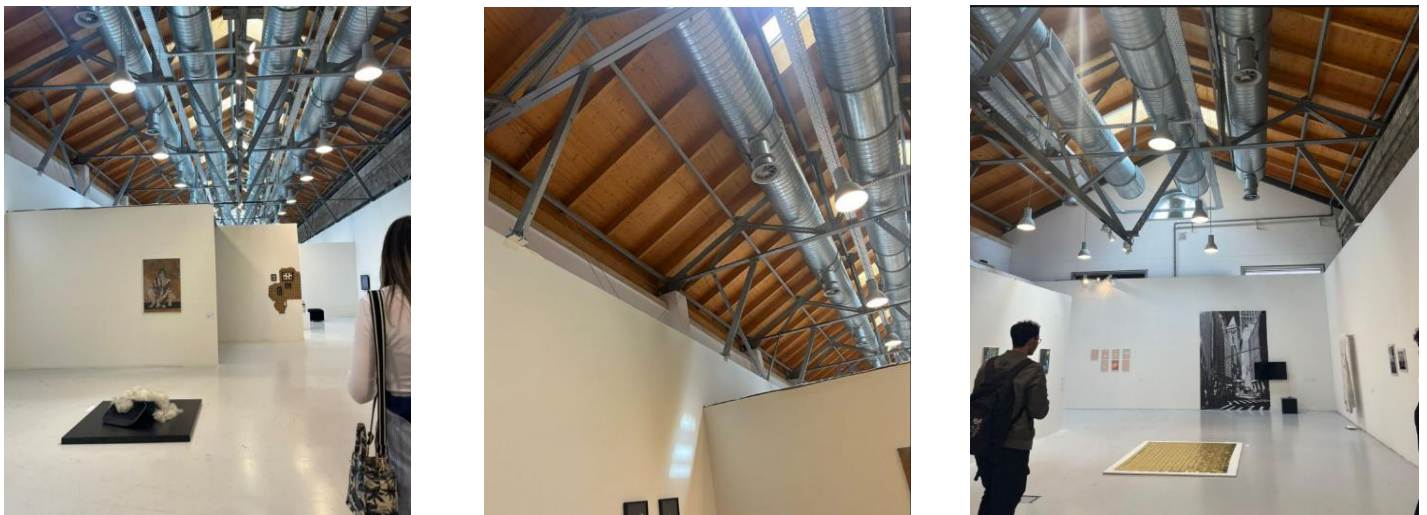


Fig. 28, 29, 30. Exhibition elements from CerModern (Authors' Archive)

5.4. Interpretation of interior atmosphere through user perception

Interior atmosphere is directly related to how users perceive a space and how they feel within it. Atmosphere does not emerge solely from the combination of physical components; rather, it is shaped by the sensory impact of elements such as light, colour, material, and spatial scale on the user [29]. Therefore, when evaluating interior atmosphere, it is important to consider not only design decisions themselves but also how these decisions are experienced and interpreted by users.

In CerModern, the interior atmosphere can be understood through the way traces of the building's industrial past are reflected in its contemporary use. Upon entering the space, the most striking features are the large volumes and high ceilings. These characteristics create a sense of openness and spaciousness for the user while simultaneously preserving the perception of scale associated with its former production function. The open-plan layout allows visitors to move comfortably within the exhibition space while maintaining the characteristic

expansiveness of industrial buildings. In this way, a natural balance is established between the spatial scale of the past and the requirements of present-day cultural use [19].

From the perspective of visual legibility, exposed concrete surfaces, metal details, and large openings do not merely form a visual background; they generate a strong sense of character within the space. These surfaces provide an intuitive reading of the building's past. Even if visitors are not explicitly informed about its former function, they can perceive its industrial heritage through the spatial atmosphere. This demonstrates that spatial memory can be conveyed not only through information but also through direct experience.

Moreover, the relationship established between the large scale of the space and the placement of exhibition elements directly influences user perception. Open and high-volume areas allow artworks to be perceived more prominently within the spatial context. The preserved industrial shell provides a dramatic yet restrained backdrop for the exhibition experience. As a result, the interior atmosphere does not create a conflict

between past and present; instead, it produces an experience in which both coexist harmoniously. In this context, the interior atmosphere of CerModern can be interpreted not merely as the outcome of physical spatial features but as a reflection of the emotional and perceptual relationship users establish with the space. The building's industrial past persists within its contemporary cultural function, gaining renewed meaning through visual legibility.

6. Discussion and conclusion

This study explains the relationship between CerModern's interior atmosphere and spatial memory through observations and visual data. The opinions of visitors and employees who experienced the space were not included in this study. Future research could involve a survey to analyse visitors' and employees' opinions, enabling a more comprehensive examination of the impact of interior atmosphere on visual legibility. Furthermore, expert opinions could be sought, and interviews could be conducted with CerModern's architects and project team. The adaptable reuse of industrial buildings is crucial for preserving and transmitting the traces of the city's and society's history to the present day. Therefore, it is necessary to adopt a design approach that preserves spatial memory while adapting it to its new function. The CerModern example, discussed in this study, is a significant example for Ankara in the transformation of industrial buildings into cultural spaces. The transformation of railway workshops into a cultural and arts centre was successfully achieved by combining old and new elements. CerModern, with its new function, is an art centre that contributes to the city's cultural context. Furthermore, it serves as an important example for the urban fabric, preserving and showcasing Ankara's industrial heritage.

Adaptive reuse projects are important for environmental, economic, and social sustainability. The atmosphere that shapes the spatial experience must also be sustainable. Atmosphere is the most important tool for bringing spatial history to the present and conveying it to visitors. In this study, the interior atmosphere of CerModern is evaluated through interventions made in line with its spatial memory and new function. This evaluation is carried out considering light, materials, colour, and exhibition elements.

Light is one of the primary elements enabling visual perception, and it is also crucial for spatial memory. In the transformation of industrial buildings into cultural spaces, new arrangements that do not recall the old lighting scenario of the space alter visual perception. Lighting design is even more important at CerModern in line with its exhibition function. The large openings, which are traces of industrial space, increase the amount of natural light entering the space. While this contributes to the atmosphere, it also poses a danger to the exhibited works. Therefore, according to the exhibition concept at CerModern, natural light is kept under control while artificial lighting sources are used to support the visual and functional requirements of the exhibitions.

Materials and colours are other important components in preserving the traces of industrial heritage. They ensure the sustainability of spatial memory. At CerModern, new interventions have been integrated in harmony with the space's overall colour and material palette. The natural colours of the materials and neutral colours have been used. In this way, the industrial language has been preserved. The interior atmosphere, with its historical texture, has achieved a holistic language through the new additions.

Exhibition elements are crucial design components of spatial experience, as they shape circulation, structure, and order within space. The exhibition elements used at CerModern are temporary, offering flexibility in use to suit different exhibition needs. Because they do not require direct intervention in the physical elements of space. Their temporary and flexible nature appears to maintain the existing interior atmosphere without requiring permanent interventions in the building fabric. On the contrary, they allow for the perception of spatial divisions and ceiling height. This contributes to CerModern being characterised as a contemporary exhibition space bearing industrial traces.

Although the interior atmosphere is theoretically inseparable from user perception, the present study evaluated it using spatial observations and visual data rather than users' reported experiences. Changes to the physical and visual characteristics of a space have the potential to influence how it is perceived and experienced. Retaining traces of the original industrial identity can support users' recognition of the relationship between the building's past and present functions. CerModern's interior atmosphere establishes a visible relationship between the building's industrial past and its contemporary cultural function. In this context, CerModern, when evaluated through the concepts of spatial memory and transformation, serves as a significant example of the evolution of industrial buildings into cultural spaces. Modern additions, compatible with the building's new function and without altering its original texture, have adapted the structure to the present day. Based on the spatial and visual analysis, the project demonstrates a coherent approach to preserving spatial memory while establishing an interior atmosphere appropriate to its new function. The interior atmosphere makes the transformation process spatially and visually legible. Thanks to its holistic design approach, it references both the present as a cultural and arts centre and the past as an industrial heritage site.

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