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Renzo Piano's California Academy of Sciences：Temporal Layering and Implicit Strategies

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ABSTRACT: *Renzo Piano's California Academy of Sciences project is a representative example of remodeling a neoclassical building and transforming itinto an exhibition facility. Since its remodeling in 2008, as a natural history museum, it has been giving continuous messages to manyvisitors linking architectural space and exhibition content. In this paper, it focuses on the architectural message emphasized at the elevationof the main entrance to the exhibition hall. The facade of the California Academy of Sciences Exhibition Hall is the first starting point for welcoming visitors. Starting from the park area surrounding the exhibition hall, the façade is viewed from a distance, and through a gradualapproach, the detailed arrangement of the facade is sequentially exposed to the visual. This is meaningful in that it analyzes how thebuilding gives visitors a valid architectural message along with several vertical layers of traces that suggest time.*

KEYWORDS -*Renzo Piano, California Academy of Sciences, Facade, Time, Juxtaposition of Materials*

I. INTRODUCTION

Renzo Piano's California Academy of Sciences project stands as a quintessential example of transforming a neoclassical architectural structure into a modern exhibition facility. Following its renovation in 2008, the building evolved into a natural history museum that continues to deliver enduring and thought-provoking messages by seamlessly integrating architectural space with exhibition content. This paper focuses on the architectural messages emphasized in the elevation of the main entrance, a key point of interaction for visitors entering the exhibition hall.The facade of the California Academy of Sciences exhibition hall serves as the first point of engagement, presenting itself initially from the surrounding park area. Visitors encounter the facade as a distant visual marker that gradually unfolds its intricate details through a sequential process of approach. This deliberate progression enables the architectural elements to reveal themselves incrementally, heightening the visitor's spatial and visual experience. By analyzing the vertical and horizontal relationships within the facade, as well as its spatial layering, this paper aims to decode the architectural messages that visitors perceive during their journey.

Figure 1.Changes in the Facade Before and After Remodeling

The renovation process introduced a dynamic interplay between the old and the new through the strategic use of materials. Transparent and opaque elements were meticulously balanced, with careful consideration given to the directionality, thickness, and spatial relationships of various components. The interaction between the preserved volume of the historical structure and the newly added elements creates a dynamic architectural dialogue. This juxtaposition not only harmonizes the past and present but also reflects a deeper narrative of time embedded in the building's design.

Through its vertical layering, the facade becomes a medium for conveying architectural messages that resonate with the passage of time. The transparent and opaque materials accentuate the interplay of light and shadow, further enriching the visual storytelling. Visitors are invited to experience the subtle yet profound ways in which the building embodies temporality, emphasizing Renzo Piano's mastery in designing spaces that engage with both their historical context and contemporary purpose. By analyzing these elements, this study contributes to a deeper understanding of how architecture can serve as a narrative tool, bridging the temporal and spatial dimensions to create meaningful visitor experiences.

II. CONTRAST OF TEMPORALITY

In the remodeling project, there exists a temporal gap between the "before" and "after." The juxtaposition of the old and the new prompts viewers to consider the invisible process of recognizing the passage of time. Depending on how these elements are arranged, different perceptual tendencies and interpretations can emerge. In the case shown in Figure 2(a), where the old and new are placed side by side in parallel, there is a clear distinction between the two, emphasizing their coexistence as separate entities. This arrangement highlights the contrast between the past and the present, inviting the viewer to reflect on their differences.

In contrast, Figure 2(b) illustrates a scenario where elements are placed in a relationship of depth and spatial layering. The overlap between the near and the distant elements, along with the enclosure of the background surfaces, creates a dynamic visual experience. This arrangement allows the viewer to perceive how elements in the foreground and background interact, adding complexity and depth to the perception of time.

Finally, Figure 2(c) shows an arrangement where multiple layers and directionalities intermingle across various surfaces, such as the front and rear or left and right planes. This multilayered integration emphasizes the blending of disparate elements, creating a more complex, multidimensional composition. Such arrangements further accentuate the notion of time as a layered, evolving concept, where different temporal moments coexist and interact.

The California Academy of Sciences, through the strategic selection of these different arrangements—(a), (b), and (c)—guides visitors approaching the entrance of the exhibition hall to experience a sequential sense of time. The architectural design deliberately creates a journey that not only merges historical and contemporary elements but also evokes a deeper awareness of time through visual and spatial cues. This allows visitors to feel the passage of time as they approach and experience the building, adding an emotional and intellectual dimension to their interaction with the space.

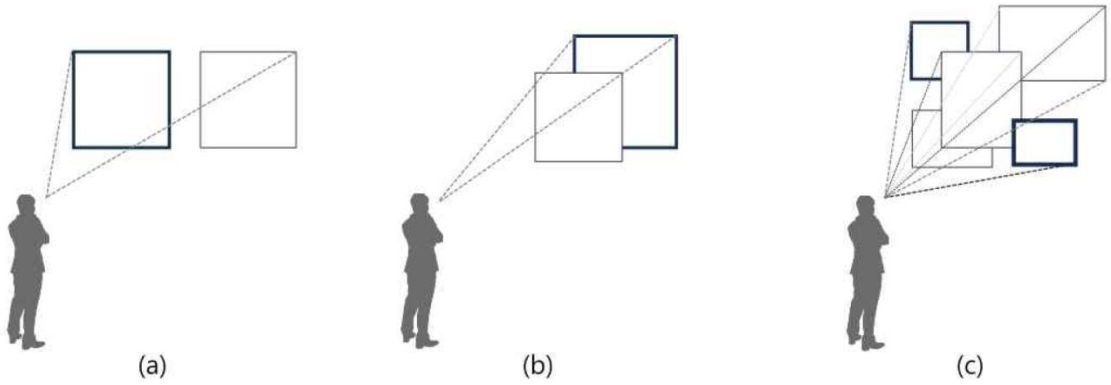

Figure 2. Diagram of Material Juxtaposition

III. Material Juxtaposition and Architectural Message

Figure 3(1) symbolizes the materials and forms of the exhibition hall before the remodeling. In contrast, Figure 3(1-1) showcases a similar volume that mirrors the previous one, with matching colors and textures. This new volume forms a near-perfect symmetry with its counterpart, drawing visitors in through the open space between the two. The spatial interplay between the volumes creates a smooth transition that invites visitors to approach, with a visual effect that feels both balanced and harmonious. This carefully calibrated symmetry is further enhanced by the shading structure shown in Figure 3(4) and the orderly arrangement of columns in Figure 3(4-1), which establish a more organized and polished symmetry.

The primary symmetry is initially expressed through the heavier, more substantial materials placed in the lower part of the structure, such as the dense volumes of Figures 1, 1-1, 2, and 3. These are contrasted by the relatively lighter materials positioned higher up, such as the materials in Figure 3(4), which are supported vertically by slender columns in Figure 3(4-1). This combination results in a sense of lightness and welcoming, creating an atmosphere that feels fresh and inviting.

In addition to this sense of welcome, the design incorporates elements that draw visitors deeper into the space. One such element is the skylight in Figure 3(6), which enhances the sense of transparency and openness, inviting light into the interior. Another key feature is the artificial lighting arrangement in Figure 3(5), which provides clear directional cues toward the skylight. This duality of transparent and directed light helps suggest a passage of time through the old walls and directs the visitor's focus inward. The design emphasizes a connection between the physical movement through the space and the directionality of the visual elements, creating a stronger sense of absorption and guiding the visitor’s experience.

The directionality of this absorption is particularly powerful because it aligns with the movement paths and gaze of the visitors. As they move through the space, they are led toward the light-filled interior, with a sense of temporal depth that grows more intense with each step. This visual acceleration—due to the focused nature of the design elements—creates an enhanced sense of spatial dynamism and immersion.

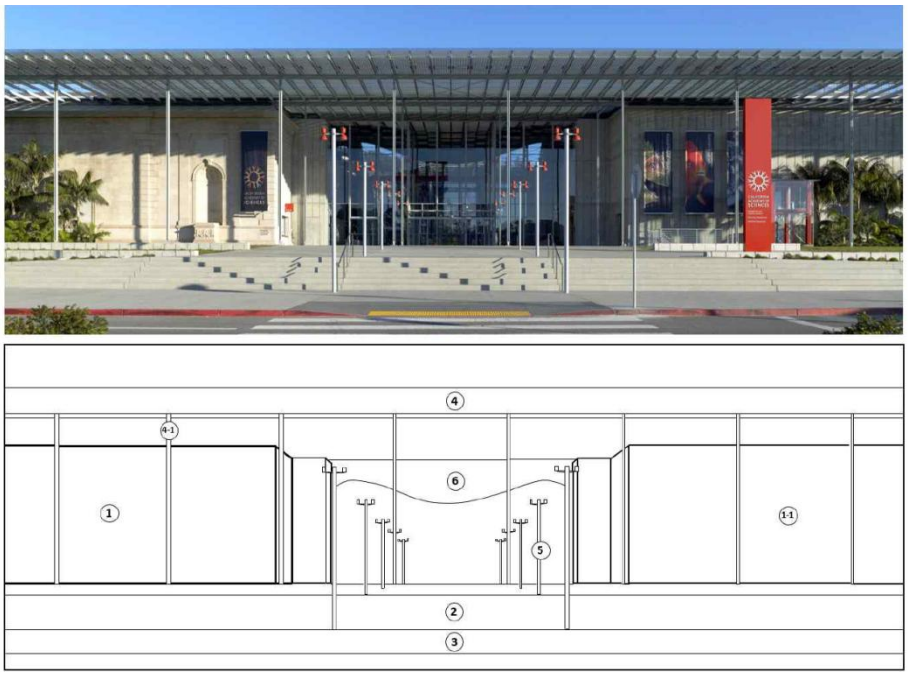

Figure 3.Facade Elements of the Front Entrance

Figure 4 demonstrates the contrasting materials used in the facade of the Science Academy. The heavy stone elements in **Figures 1 and 1-1** suggest solidity and weight, reinforcing the sense of permanence. In contrast, the newly added structures in the surrounding areas are lighter, with thinner, more transparent materials that contrast with the heavier massing of the stone. As visitors approach the entrance and view the building from the side, they encounter a pronounced volumetric effect of the thick materials, such as the concrete walls visible in **Figure 4**. This massing contrasts sharply with the lightweight expression of the new materials shown in **Figure 5**, offering an intriguing architectural experience that traverses the solidity of time while maintaining a lively, dynamic quality.

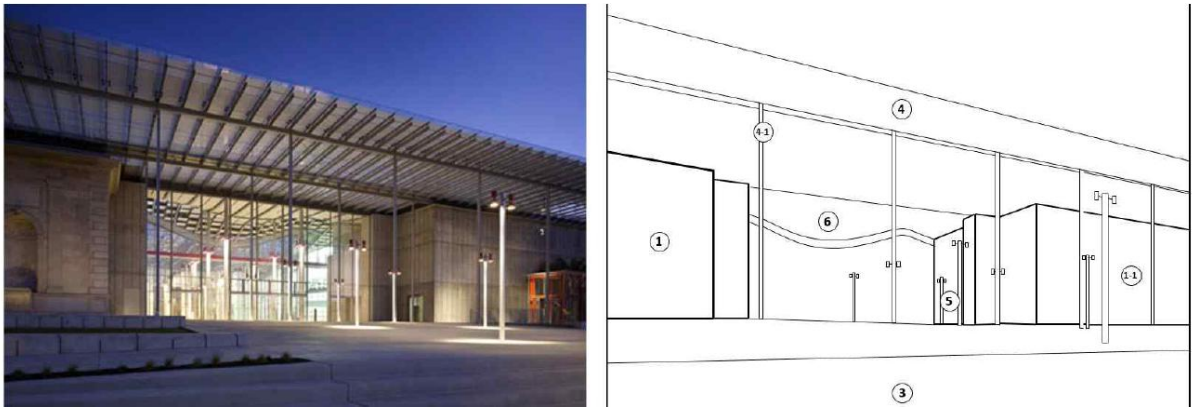

Figure 4.Nighttime Side View of the Main Entrance Approach

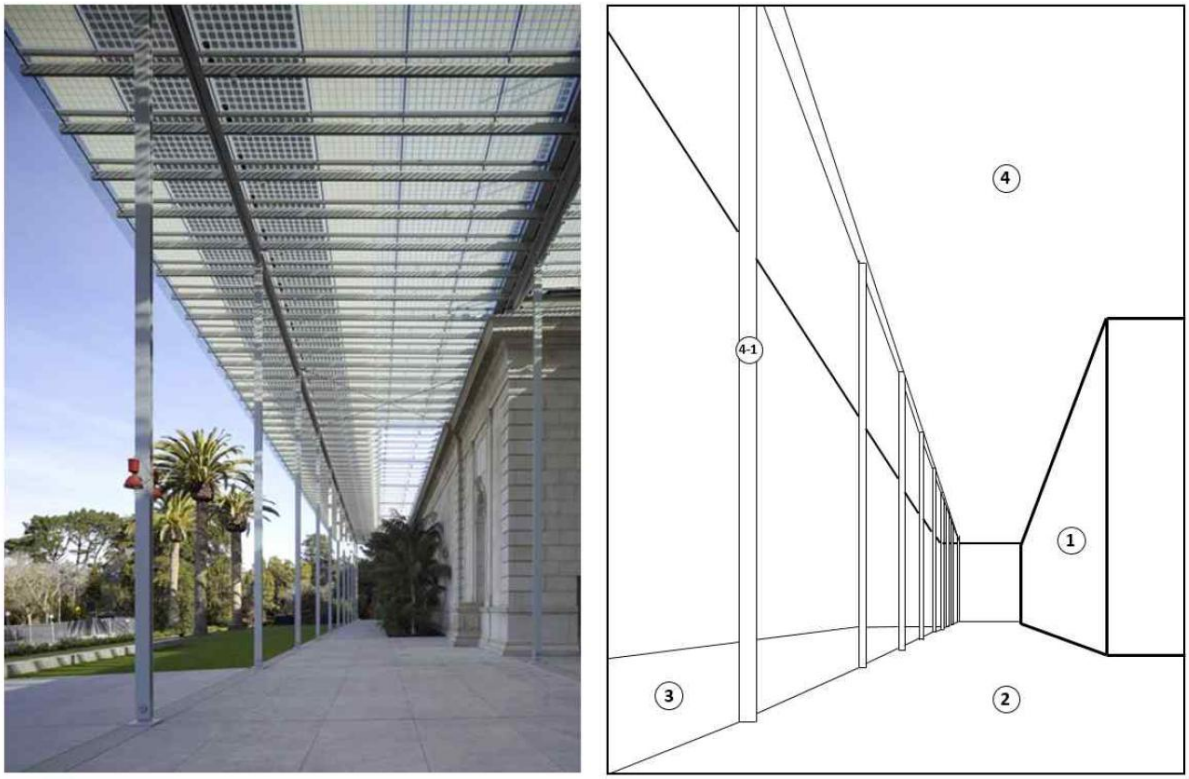

Figure 5.Side View of the Main Entrance Approach

IV. Conclusion

In architecture, the manifestation of temporality is an encompassing task that engages both the senses and memory. The methods used to evoke this experience include the careful selection of materials, the articulation of their joints, the precise adjustments of the thickness and form of structural elements, and the establishment of spatial relationships that guide movement through the space. The California Academy of Sciences, as a remodeling project, uniquely manages to preserve and evoke the memory of the previous exhibition hall while simultaneously showcasing the technical advancements of the new materials. This study focuses on the facade at the entrance, analyzing the perceptual characteristics based on the weight of materials, the directional arrangement, and the sequence in which new structures envelop the space.

Through this analysis, the study highlights Renzo Piano's distinctive approach in renovation projects, emphasizing the continuity of his methodology. This provides insights into the sustainable design principles he employs, allowing future architectural endeavors to build on this successful combination of past and present, creating meaningful architectural narratives that engage the visitor's senses and awareness of time.

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