Revitalizing Historical Legacy: The Restoration of Xingguo Hotel's Building No. 2 and its Integration into Modern Urban Development

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Abstract. This study details the conservation and restoration of Building No. 2 at Xingguo Hotel, a significant historical site in Shanghai, with a particular focus on its civil engineering and architectural structural aspects. Employing Evidence-Based Design Methods for evaluation, the restoration project centered on preserving the building's historical, artistic, and architectural significance while addressing structural challenges. Key interventions included indoor space restoration to revive the original layout, facade reconstruction guided by historical references, and innovative structural adaptations. These efforts aimed to safeguard the building's historical integrity while accommodating contemporary urban needs. This project underscores the importance of a methodical approach to historical building restoration, harmonizing structural considerations with conservation to preserve cultural heritage in an urban environment.

Keywords: Building conservation, Renovation project, Architectural structure, Civil engineering, Building No.2.

1 Introduction

This study delves into the restoration of Building No. 2 at Xingguo Hotel, an iconic historical structure in the urban landscape of Shanghai, with a particular emphasis on its civil engineering and architectural structural aspects. Originally erected in 1925 as part of Taikoo Bank's properties, this building exemplifies the English garden house style prominent in early 20th-century Shanghai [1]. The primary objective of the project was to address the challenges of restoring the building's original architectural integrity while adapting it to modern urban needs. This necessity arose due to significant alterations over the years, which had led to the loss of original materials and structural transformations [2]. Employing Evidence-Based Design Methods, this research aimed to assess and preserve the building's historical, artistic, and cultural value while ensuring its continued relevance in Shanghai's contemporary urban setting. This introduction sets the stage for a comprehensive discussion of the methodologies and outcomes, with a focus on the civil engineering and architectural structural aspects [3].

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1.1 Background

Building No. 2 of Xingguo Hotel, constructed in 1925 as one of the Taipan residences of Taikoo Bank, is a prime example of a typical Taipan residence that played a significant role in Shanghai's modern development history. The building's architectural style embodies the essence of a modern English garden residence in Shanghai. Its strategic location, situated on the north side of Xingguo Hotel at No. 78 Xingguo Road, juxtaposed with the garden and building complex of Xingguo Hotel to the south, and facing the intersection of Jiangsu Road and Huashan Road to the north, makes it an integral part of Huashan Road's important streetscape [4]. Over nearly a century, the building has undergone numerous changes, resulting in the loss of many of its original historical decorations and a significant degree of damage to its interior layout. Consequently, the building's original appearance has faded, necessitating urgent restoration to preserve its protected sections and recreate its historical significance within its important urban context.

2 Civil Engineering and Architectural Structural Site Investigation

Given the limited availability of historical materials and graphic records, the on-site investigation was paramount for the success of this conservation and restoration project, especially concerning its civil engineering and architectural structural aspects. Architects conducted several site visits at the project's onset to conduct thorough investigations. On the surface, the building had suffered extensive alterations, additions, coverings, and modifications over the years. The preservation of original materials on the facade and interior spaces was unsatisfactory. For instance, the building's foundations were painted with light pink paint, while most exterior walls were covered with beige cement brushed walls. Only the first floor of the south facade retained the original clear water brick wall. Notably, this wall was not the original material for the building facade, as the brushing process was not prevalent in early 1920s Shanghai. The original facade materials could not be identified. The building featured aluminum alloy sliding windows and doors, and the roof tiles consisted of mechanism flat tiles [5]. The original second-floor corridor had been enclosed as an interior space, and some doors and windows on the first floor had been blocked. The north elevation displayed red wooden windows, and the glass window in the primary stairwell remained intact [6]. Several additions were evident on the building's facade, including a one-story flat-roofed structure added to the north facade, which connected to the north entrance of the original building. In addition, a circular-gabled decoration-adorned structure was added to the northeast corner, unconnected to the interior of the building. It featured an entrance on the east side. Another one-story flat-roofed addition was made at the southwest corner, connected to the original building and adopting the same corridor style as the original structure. It replaced the glass flower room originally located at the southwest corner [7]. The west side was connected to the staff kitchen of the hotel's Magnolia Building. Despite these modifications, some original architectural details remained, such as brick

voucher window lintels, line footings, wooden roof frames on the mountain wall surface, closed eaves boards, and other details. The corridor flooring comprised stone flooring, with columns and wall surfaces featuring water brick material. The columns and column bases retained historical line footing decoration, as shown in Figure 1.

Fig. 1. South Elevation Addition with Historic Glass Flower Room

3 Appraisal of the value of the building

Incorporating Evidence-Based Design Methods (EBD), the project employed a comprehensive evaluation approach to optimize the conservation and renovation processes, particularly from structural and civil engineering perspectives, while preserving the historical and architectural significance of Building No. 2. An Architectural Value Score system was utilized to quantitatively assess the building's historical importance. To assist in the conservation and renovation planning, a Conservation Informational Sheet categorized the historical building into key and non-key conservation components, with a particular emphasis on structural and civil engineering aspects.

Building No. 2 possesses significant historical, artistic, scientific, social, and economic value, making it a remarkable cultural heritage site. The building's history is entwined with the legacy of Taikoo Bank in Shanghai, rendering it historically significant. Its architectural elements, including the English garden house style, red tiles, and decorative features, contribute to its artistic value. The architectural form and construction techniques exemplify the typical garden house architecture in Shanghai, enhancing its scientific value. From a social perspective, Building No. 2 is an integral part of Taikoo Circle's history and has become an urban landmark as Xingguo Hotel. Its economic value is underscored by its effective utilization since its construction. Despite modifications to the building's interior, the original spatial layout has been preserved, and additions have expanded its functionality, particularly its connection to the northern part of the city, further enhancing its economic value. Furthermore, structural improvements, including the transition from brick to brick-concrete reinforcement, have increased its load-bearing capacity and overall structural stability. The combined qualitative and quantitative assessment of the building's value resulted in an overall score of 50 points, tentatively classifying it as a Class II protected structure. Key areas for

protection encompass the main facade, interior structure, building unit facade, roof, and external green environment. Internally, the spatial pattern, foyer, porch, and stairwell were identified as key areas for preservation (Table 1) [6].

Table 1. Key Areas for Protection and Preservation in Building No. 2

Evaluation Criteria	Weight (%)	Time Value	Historical Value	Design Value	Technical Value	Social Value	Cultural Value	Aesthetic Value	Economic Value	Total Score
Historical Value	20%	8	3	-	-	-	-	-	-	11.8
Scientific Value	20%	-	-	6	3	-	-	6	-	9
Social-Cultural Value	20%	-	-	-	-	3	3	-	-	6
Artistic Value	20%	-	-	6	-	-	-	6	-	12
Economic Value	20%	-	-	-	-	-	-	-	6	6
Total Score	100%	8	3	12	3	3	3	12	6	45.8

Note: The scores are on a scale from 1 to 10, with 10 being the highest score. The total score is calculated based on the weighted sum of individual criteria scores. The table shows a total score of 45.8 for the evaluation of Building No. 2 at Xingguo Hotel.

4 The analysis of the causes of disease and damage to Building No.2

The building exhibited extensive damage in various aspects, including structural and civil engineering challenges. Its overall appearance had been compromised by changes in ownership and numerous alterations for different functions, resulting in significant modifications to three of its facades. Only the main south facade retained its original appearance. The architectural style had shifted towards a more modern reconstruction, characterized by simple aluminum alloy windows and doors, lacking the historical details of the original construction. Additionally, changes in the building's spatial layout occurred due to numerous commercial leases, leading to man-made additions and alterations to the walls. Lightweight partition walls had been added indoors, significantly altering the spatial layout and expanding the building's utility. Both the interior and exterior decorations had suffered severe damage, with most of the original doors and windows lost or damaged, and the original decorative features nearly absent. Furthermore, historical information about interior details such as fireplaces, wainscotting, and ceilings was notably lacking. Despite its advantageous geographical and commercial location, Building No. 2 faced issues with its internal environment. The building's small patio was overgrown, rendering it ineffective and environmentally unsanitary.

5 Establishment of a building conservation and renovation program

5.1 Indoor Space Repair

A collaborative on-site investigation and historical data analysis revealed that the original layout of the building's South Room, North Foyer, and West Auxiliary areas had a reasonable and clear flow. Consequently, the restoration design prioritized the removal of all later-added partition walls within the interior to reinstate the building's original layout. The foyer space was retained to accommodate future tenants or hotel use, and a new north entrance was designed. The first floor of the building was expanded to create a historic north entrance connected to the main historic building through a connecting corridor. Landscape design was incorporated to enhance the building's patio, improving its functionality and aesthetics. By connecting the north foyer with the north entrance through the corridor and enhancing the inner patio through landscape design, the goal was to restore the original indoor entrance while guiding visitors through layers of historical life scenes. Additionally, a passageway on the north side of the building was created to connect it to Huashan Road and Jiangsu Road, expanding its accessibility to pedestrians (Figure 2).

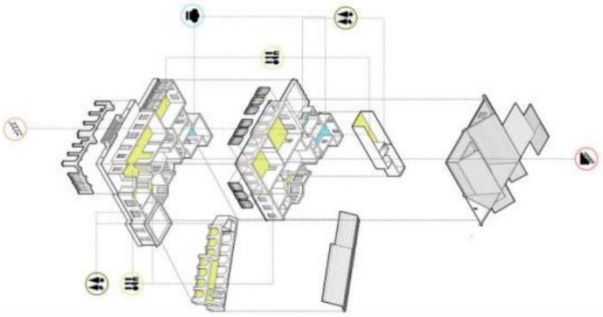

Fig. 2. Axonometric drawing of interior space repair

5.2 Facade Restoration

Despite the scarcity of historical materials on the facade, architects made restoration decisions by combining historical photographs with a typological restoration program. The first floor of the building retained a historical water brick wall, so the facade referenced materials typical of garden house buildings from the same period, utilizing "water brick + cement mortar." This involved restoring the original water brick material on the first floor and employing different repair techniques for various levels of damage. A new beige plane of cement mortar was applied to the second-floor facade to replace the existing brushed mortar material. The south elevation of the second-floor corridor featured a combination of balustrades and floor-to-ceiling windows, inspired by the style of wooden balustrades seen in historical photos of the building [8]. The use of different

materials aimed to evoke a sense of the building's history while incorporating modern elements. The north elevation's glass windows played a central role in reflecting the building's characteristics and style and were a key focus of the conservation and restoration project (Figure 3).

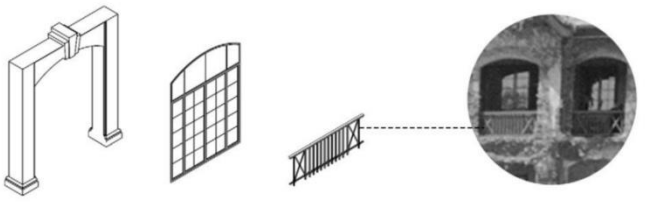

Fig. 3. South elevation floor to ceiling window railing style design drawings

5.3 North Façade Reconstruction

The reconstruction of the north façade of Building No. 2 at Xingguo Hotel showcased a harmonious blend of historical preservation and modern urban development principles, reflecting the integration of civil engineering and architectural design. The transformation of the north façade into the main entrance was achieved by employing advanced construction techniques and materials.

To seamlessly merge the new addition with the original historic building, clear water brick walls and skillfully sloping roofs were used to shape the overall form of the structure. This innovative approach combined continuous arcades and floor-to-ceiling windows with expansive glass, creating an architecturally striking, modern, and elegantly arched elevation [9]. This design not only increased the building's transparency but also highlighted the intriguing contrast between different eras [10]. Furthermore, it paid homage to the historic building behind it, inviting visitors from a contemporary, minimalist structure to explore the enigmatic charm of the historical edifice.

6 Conclusion

The restoration of Building No. 2 at Xingguo Hotel in Shanghai serves as a remarkable exemplar of how civil engineering and architectural structures can seamlessly coexist with historical preservation in the context of modern urban development. This project, executed with precision and guided by Evidence-Based Design Methods, adeptly surmounted the challenges of conserving a historically and culturally significant building while aligning it with contemporary urban needs.

Key accomplishments of this restoration encompass the meticulous refurbishment of the building's interior, the careful restoration of the façade utilizing historical construction materials, and the innovative reconstruction of the north façade that artfully fuses historical elements with contemporary design. These endeavors not only safeguarded the architectural heritage of the building but also elevated its functionality and accessibility within the urban milieu.

This project aptly illustrates the potential of historic structures to continue playing pivotal roles in the urban landscape, seamlessly merging civil engineering and architectural design while enriching the city's cultural narrative and satisfying modern requisites. The restoration of Building No. 2 serves as a compelling testament to the imperative of conserving urban heritage, offering invaluable insights for forthcoming restoration endeavors worldwide. It serves as a paradigm of how heritage buildings can metamorphose into vibrant, functional spaces that reverentially uphold their historical legacy while invigorating contemporary city life.

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