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A study on the design and concept of Guilin Landscape Building in Shang Kuo based on the Beaux-Arts system

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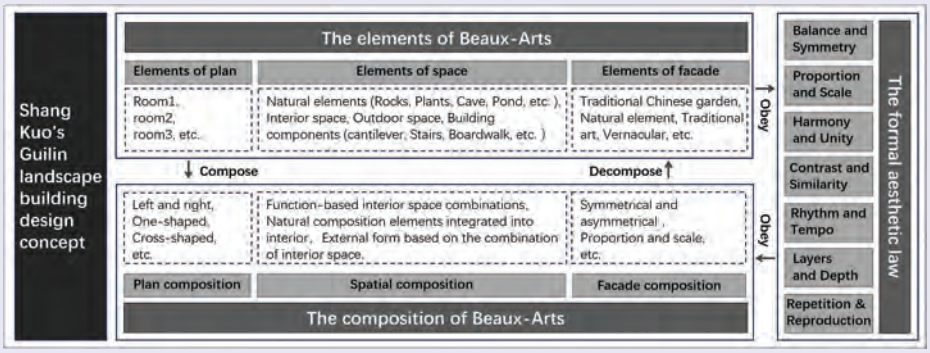
ABSTRACT

The Beaux-Arts system, once an important international architectural design method, represents a significant and challenging area of research when considering its localization in China. Shang Kuo, a Chinese architect influenced by the Beaux-Arts concept, demonstrates the heritage and development of the Beaux-Arts system through his landscape buildings in Guilin. This study selects six representative cases from Shang Kuo's landscape buildings in Guilin and analyzes them based on the Beaux-Arts system. The analysis focuses on four aspects: plan composition, spatial composition, facade composition, and the formal aesthetic laws of composition. The research reveals that Shang Kuo's works exhibit three balanced choices of axis composition in their plans. He innovatively incorporates elements such as residential buildings, garden architecture, traditional Chinese art, and natural elements into the composition of his buildings, while emphasizing the harmonious integration of interiors and facades and adhering to the principles of aesthetic form. This study shows the way of localizing Beaux-Arts architecture through Shang Kuo's landscape buildings in Guilin and contributes to the understanding of the development of modern Chinese architecture.



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Landscape building; Beaux-Arts; composition; elements; primary rules

1. Introduction

1.1. Historical background

During the political turmoil of the 1970s, normal construction in China came to a standstill. this paralysed design units across the country and caused an unprecedented catastrophe in the field of architecture (Zou, Dai, and Zhang 2010).[1] In 1973, Guilin was selected by the State Council as one of the 24 open cities for tourism to strengthen diplomatic relations with foreign countries. The city of Guilin aimed to showcase and publicize the achievements of socialist construction, which led to numerous landscape planning and construction activities. Shang Kuo took advantage of this opportunity in the 1970s to create various types of landscape buildings, such as pavilions, gazebos, water pavilions, reception rooms, bonsai gardens, gates, bridges, etc.,[2] which were rare during the "window period" of the national architectural industry at that

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[1]Before 1978 (the reform and opening up), Chinese designers were influenced by political factors and could not fully understand Western architectural concepts such as modernism, and were mainly trained in the unified the Beaux-Arts model with relatively conservative concepts.

[2]The landscape building in Guilin designed by Shang Kuo at that time include Ludiyan Scenic Area - Sky Bridge (1973), Seven Stars Scenic Area - Arched Star Mountain Gate (1974), Seven Stars Rock Cave Building - Pavilion (1974), Ludiyan Scenic Area - VIP Reception Room (1975), Seven Stars Rock VIP Toilet (1975), Seven Stars Scenic Area - Qixia Pavilion 1975 (1975), Seven Stars Scenic Area - Bonsai Garden (1977) Ludiyan Scenic Area - Fanglianling Water Pavilion (1977), Shanhu Scenic Area - Corridor Pavilion (1979), Shanhu Scenic Area-Mushroom Pavilion (1979), Ludiyan Scenic Area - Stalactite Cave Mountain Gate, Ludiyan Scenic Area - Rest Corridor, Wangjiang Pavilion on Binjiang South Road, Zengpiyan Exhibition Hall, Ronghu Hotel Building 4 (State Guesthouse) (1973), etc.

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time. Consequently, Yao Yanbin (2009) considers Shang Kuo as a representative of regional architects in the 1970s, and his landscape building as emblematic of China's regional architecture from 1965 to 1979.

However, current research has not fully revealed the design and concept of Shang Kuo's Guilin landscape building. In the study of Shang Kuo's landscape building, most of the previous studies are the personal experiences and architectural comments of researchers, such as Li and Jing (2022), Weng (2020), Kang (2019), Sha and Feng (1988), Wei (1983), etc., which can inspire the creative thoughts of readers, but the original creative intentions of the designer himself in the creation of landscape building is still not explored. Shang Kuo himself has made a rough interpretation of the design of landscape buildings, such as Landscape Building Design (Shang 1999), Residential Architecture: An Important Reference for New Architectural Creation (Shang 1980) and Guilin Landscape Building (Guilin Architectural Design Office 1982), and also has an overview analysis from planning to architectural level for Bonsai Garden (Shang 1982), Seven Star Scenic Area (Shang 1980), and Ludiyan Scenic Area (Shang 1978). Thus, Further research is therefore needed on Shang Kuo and his works.

1.2. The landscape buildings designed by Shang Kuo are the practice of localizing the Beaux-Arts

Shang Kuo, as an architect trained in the Beaux-Arts system, designed a series of landscape buildings in Guilin. These landscape buildings demonstrate Shang Kuo's exploration of the localization of the Beaux-Arts.

One of the core meanings of the Beaux-Arts (or "Academicism") is a specific design style characterized by a set of procedural, methodological, and ideological principles (Wang and Liu 2021). In the early 20th century, the first generation of Chinese architects "transplanted" the Beaux-Arts system from the United States to China. The eclectic design approach of Beaux-Arts gradually changed, marking the beginning of the localized development in China under different sociopolitical and cultural contexts (Gu 2015; Wang and Shan 2017). Shang Kuo grew and developed during this period, and research has found that he was not only educated in the Beaux-Arts system, but was also influenced by modernist ideas (Shen and Lin 2022, 2021). Through interviews with Shang Kuo's colleagues, it was found that Shang Kuo often incorporated Beaux-Arts principles when discussing design issues.[3,4] In addition, Shang Kuo's complex knowledge system also included insights from vernacular architecture and an understanding of the relationship between architecture and the environment (Lin and Jing 2022). The rich design concepts of Shang Kuo have provided nourishment for subsequent localized design in the field of architecture.

In addition, landscape building has its own inherent "scenic" design attributes (Dong 2019). Designers must pay attention to the relationship between the building and its environment, ensuring that it is visually appealing and harmoniously integrated into the environment. However, the Beaux-Arts as a design method, through its core operations such as composition, elements, and primary rules,[5] combines the various components of architecture according to specific axes, proportions, and aesthetic relationships. It aims to express classical principles such as axis, symmetry, unity and order in architectural design. However, Guilin's natural landscape is rich in variation and irregular shapes, coupled with the diverse functional requirements of landscape building. Therefore, Shang Kuo believes that larger landscape building with a larger footprint require afreer and more flexible approach to asymmetrical composition (Shang 1982). This characteristic leads to a "contradiction" between the design of landscape building and the classical architectural design of the Beaux-Arts. This requires Shang Kuo to make modifications and adaptations to the Beaux-Arts style for his use. This emphasizes the importance of addressing the localization problem of Beaux-Arts in the process of creating landscape building.

Therefore, this study focuses on the landscape buildings designed by Shang Kuo in Guilin as a case study of the localized development of the Beaux-Arts in China. The objective is to advance the theoretical study of the Beaux-Arts, address the gaps in the development process of modern architecture in China during the 1970s, analyze an exploratory path in the development of modern architecture, deepen designers' understanding of the design methodology of the Beaux-Arts, and provide them with a typical case and historical experience for creating landscape buildings in picturesque locations, thereby expanding their choices for design methodologies and innovative approaches in practice.

[3]Shang Kuo's colleague Tang Qingbao stated, "I often discuss issues such as plan composition, facade composition, spatial composition, and the balance and coordination of architectural composition in my designs. I learned from Shang Kuo, he is my predecessor, and his works are examples for us to learn from. I learned to create following his habits, and these things are also absorbed unconsciously because when I design, we always discuss design issues, and everyone naturally talks about these things." (Location: Tang Qingbao's home; Date: October 22, 2023; Method: On-site interview).

[4]Shang Kuo's colleague Lan Bo mentioned, "The spatial composition variations in Shang Kuo's designs are interesting. He handles the combination of limited space and integration with the environment exceptionally well. The language of architecture and the simplicity of the plan abstract traditional architectural elements." (Location: Guilin Architectural Design Institute; Date: January 3, 2019; Method: On-site interview).

[5]"Composition", "elements" and "primary rules" are the important elements of the Beaux-Arts. "Composition" is an architectural design method that first addresses the needs of the plane function and then coordinates the three-dimensional whole, mainly by placing, joining, and unifying the parts of the whole together, and the parts used to construct the building as a whole are "elements", such as walls, doors, vaults, roofs, etc, The "rules" are the universal principles of architectural proportion, scale, rhythm, and style. For details, see: David Van (1977); Reyner (1980); John F. (1927).

2. Research method

This study primarily adopts a case study approach within the framework of historical research methods. First, this paper synthesizes the existing discussions in the field about Shang Kuo's works, as well as Shang Kuo's descriptions of specific landscape buildings. From about 16 landscape buildings designed by Shang Kuo during his 14 years period in Guilin starting from 1965, 6 major projects were selected for case analysis. These projects include the Waterside Pavilion in Ludiyan Scenic Area, the VIP Reception Room in Ludiyan Scenic Area, the Waterside Pavilion in Shan Lake Scenic Area, the Bonsai Garden Water Pavilion in Seven Star Scenic Area, the Bixu Pavilion in Seven Star Scenic Area, the Building No. 4 in Rong Lake Hotel. Then, based on research data from books, journals, architectural drawings from the Urban Construction Archives, field surveys, interviews, and other sources, the study analyzes the cases based on the core elements of the Beaux-Arts system, including its composition, elements, and primary rules. A detailed analysis is conducted on the case examples in terms of the axis system of architectural plan composition, spatial composition, the architectural style of facade composition, and the principles of aesthetic form. Finally, the characteristics of Shang Kuo's Guilin landscape buildings and the design concept of the Beaux-Arts are summarized, thus revealing a way for Beaux-Arts architecture to transition from tradition to modernity.

3. Planar composition pattern (parti) unfolded by the axis system

In the plan layout of architectural space, the Beaux-Arts design selects an appropriate pattern for the design conditions from a set of established patterns of architectural volumes (parti in French) (CRET Paul 1908; Nathaniel Cortlandt Curtis 1923) (Figure 1). Shang Kuo uses the "left-right" "one-shaped" and "cross-shaped" axes as the layout of the building (Figure 2).

The axial system is a typical feature of the Beaux-Arts architecture and serves as the main guideline for arrangement of the building, which was highly recommended in the design teaching of the Paris Academy of Fine Arts in the 19th century (Tzonis and Lefebvre 2008). While Shang Kuo continues the axis relationship of the Beaux-Arts, he also adapts the earlier completely symmetrical guidelines of the Beaux-Arts to the landscape and functional needs of landscape building, presenting a more general axis-symmetrical relationship. This approach reflects the evolution of the Beaux-Arts in response to the changing design conditions and practical requirements in modern times, while maintaining its core principles of axial symmetry and organization.

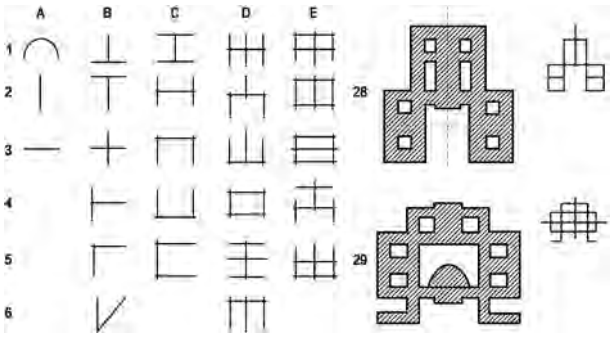


Figure 1. Parti. From Nathaniel Cortlandt Curtis (1926). Reproduced with permission.

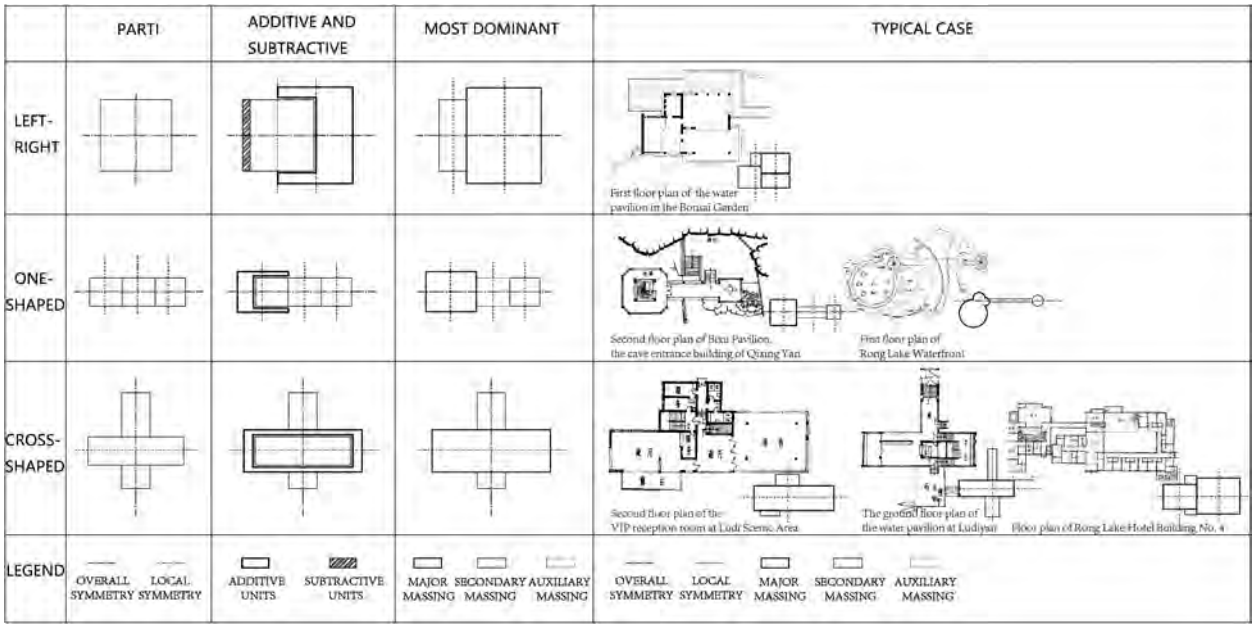


Figure 2. Analysis of "left and right", "one-shaped" and "cross-shaped" parti of Shang Kuo landscape building. Produced by the author based on Shang (1978), Guilin Architectural Design Office (1982), Wang and Zhou (2004), Shang (1999) with permission.

4. Organization by spatial composition

The spatial composition of the landscape building is the external expression of its organic combination of interior space, and the functional requirements are the basis for the organization of the interior space of the building. In organizing the architectural space, the interior space is extended to the external nature, and at the same time, the external nature is incorporated into the interior space so that the two can penetrate each other to achieve mutual penetration of both (Guilin Architectural Design Office 1982). Therefore, the following is an analysis of the spatial composition of landscape building from three aspects: Function-based interior space combinations, Interior expansion space based on "scenery viewing", external form based on the combination of interior space.

4.1. Function-based interior space combinations

Shang Kuo attaches great importance to the organization of building functions and adopts different combinations of interior spaces based on the complexity of landscape building functions.

For a landscape building with relatively single functions, Shang Kuo focuses on the organization of touring procedures, scenery cutting, and the arrangement of scenic areas. The interior space is designed with attractions to extend the tour route and provide visitors with an indoor "scenery viewing" experience. An example is the Water Pavilion in Ludiyan Scenic Area. The Water Pavilion is located at the end of the tour itinerary, and visitors walk downhill from the exit of the VIP Reception Room. The Water Pavilion meets the needs of boating, resting, scenery viewing, and management services. The scenery is presented one by one as tourists walk along the tour route inside the building, such as the frame scenery of the scenic window, the seal-type window pane of "江山如画" (it means rivers and mountains are picturesque) in vermilion seal script, the "fish fun" wooden window pane, "pine and crane" iron window, and "lotus flower" Tingbu, etc.. These designs are borrowed from the Guangxi-style brocade pattern or the flora and fauna pattern with the theme of idyllic scenery, reflecting the regional characteristics around the scenic area (Figure 3).

For relatively complex scenic buildings, they must not only fulfill the function of "scenic view", but also need to provide recreational services for visitors. Shang Kuo usually separates the service rooms from the logistic and auxiliary rooms, and places the service rooms in a location with good scenic orientation, while placing the logistic and auxiliary rooms in a secondary location.

For example, in order to make the important rooms have more good scenery view, the important first-floor open room, medium-sized reception room, and the second-floor large reception room and rest open room are arranged in the north-south direction "a zigzag", while the double single-run staircase, the second-floor open room, the logistic service rooms (duty room, men's and women's toilets, fire room, attendant's room) and small reception room on the third floor are arranged in the east-west direction "a zigzag", the small reception room on the third floor is arranged in the east-west direction on the "one-shaped". Since the eastern end of the "one-shaped" also has a good view of the landscape, Shang Kuo placed the open hall on the second floor and the small reception room on the third floor here.

The spatial composition of the building is arranged according to the merits of the landscape for different spaces with different viewing needs, with open and transparent windows and doors for spaces with good views and relatively closed for other spaces (Shang 1978) (Figure 4).

The spatial composition of the Shang Kuo landscape building is mainly classified by the attributes of function, and the axial relationship is organized according to the advantages and disadvantages of the landscape and the flow line.

4.2. Interior expansion space based on "scenery viewing"

The landscape building aims to provide visitors with a good viewing experience. Therefore, from the beginning of the spatial composition of the landscape building, Shang Kuo considers the extension of the interior space of the building to the external nature. At the same time, Shang Kuo makes full use of natural elements and interior space for composition.

4.2.1. Extending the building to the external nature

Shang Kuo aims to integrate the building with the outdoor space and extend it into nature through building overhangs, stairs, steps, water platforms, and other structures. Shang Kuo also increases the penetration and layers of space through space sequences, space divisions, gardens, and wall treatment, achieving the effect of "seeing the big with the small". One example is the spatial composition of the Bonsai Garden in Seven Stars Scenic Area, where Shang Kuo uses the interspersed layout of Lingnan garden buildings with gardens (Lin 2012), the "small in large" of the traditional Chinese garden, and the "flowing space" techniques of modern architecture (Shang 1982).

The Bonsai Garden (Phase I project) is divided into two main parts: The first part is a small space surrounded by buildings from the entrance to the landscape corridor, with five sequences of separated and continuous spaces, separated and penetrated by resting pavilions, fences, wallsand partitions, and organized and guided tour routes. The second part is a large natural space from the landscape corridor to the water pavilion,

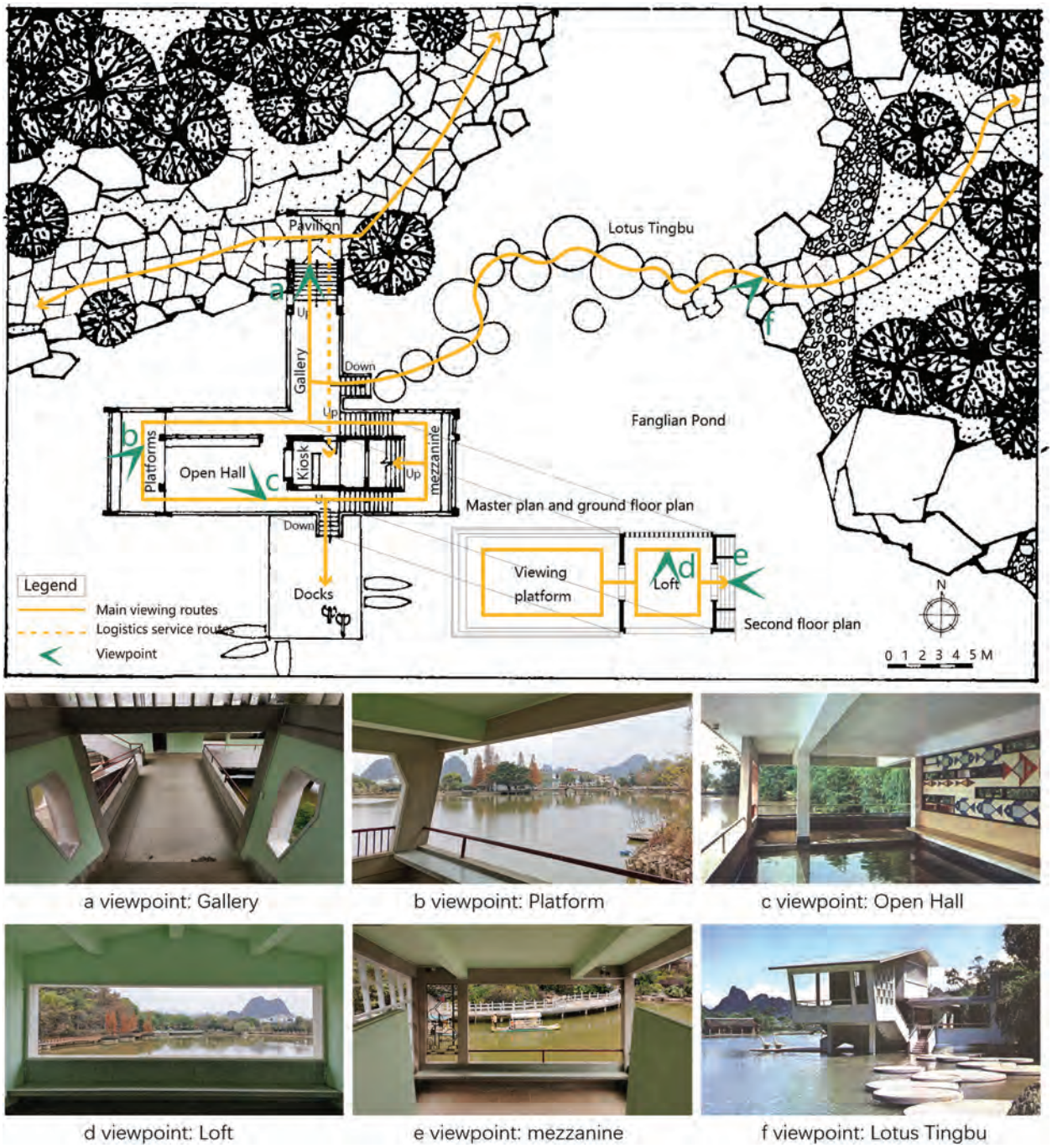


Figure 3. Road map and viewpoint for enjoying the Water Pavilion at Ludiyan Scenic Area. Produced by the author based on Shang (1978) with permission. Figure 3(a-d) produced by the author. Figure 3(c,f) from Guilin Architectural Design Office (1982).

including curved corridors and flat bridges, water ponds, and fish ponds, where the largest space in the entire park is revealed (Shang 1982). The entire spatial sequence of the Bonsai Garden presents a series of different images in an organized manner, as the landscape penetrates and changes for visitors (Figure 5).

4.2.2. Natural composition elements integrated into interior

Shang Kuo advocates the incorporation of natural elements into the composition of building interiors. Shang Kuo usually opens up the four sides of the landscape building and introduces natural elements such as flowers, plants, insects, and fish into the interior to give the building interior a natural atmosphere. For example, in the water pavilion of the Bonsai Garden in Seven Stars Scenic Area, the roof structure of the long pitched roof is raised, and wisteria and bamboo are planted inside to form a small courtyard (Figure 6). In the open hall on the ground floor of the Ludiyan Reception Room, the rocks of the original mountain are retained and combined with a pond and the arrangement of

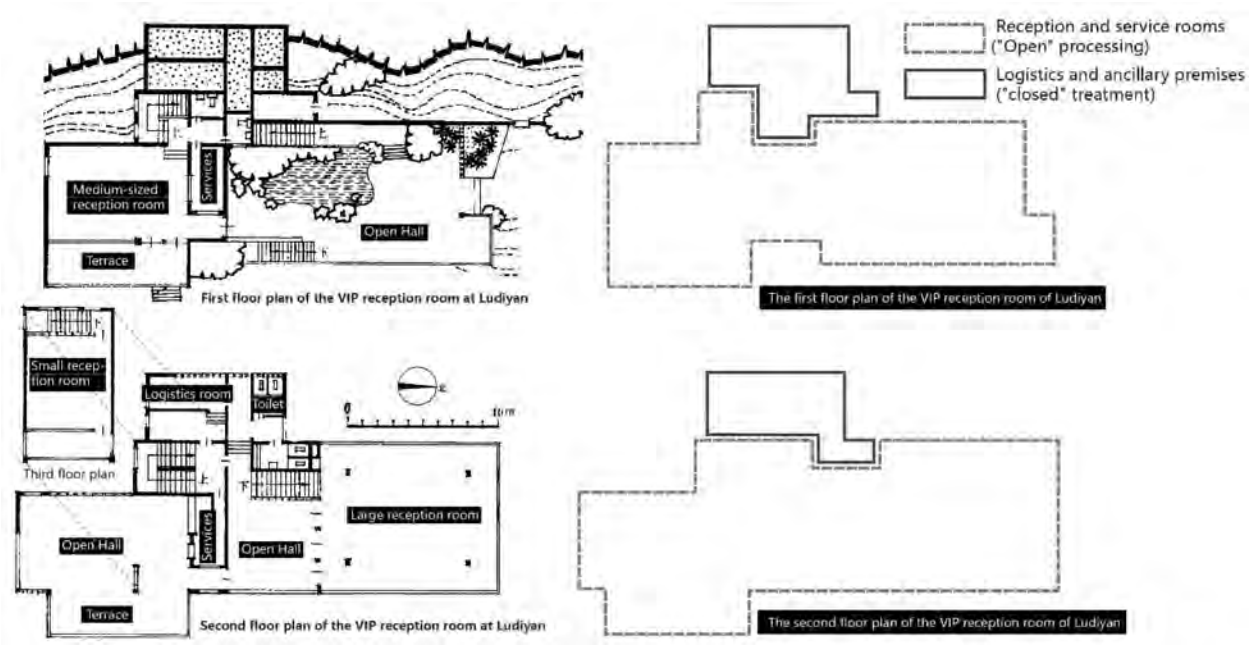


Figure 4. Diagram of the interior space combination of the reception room of Ludiyan Scenic Area. Produced by the author based on Shang (1980) with permission.

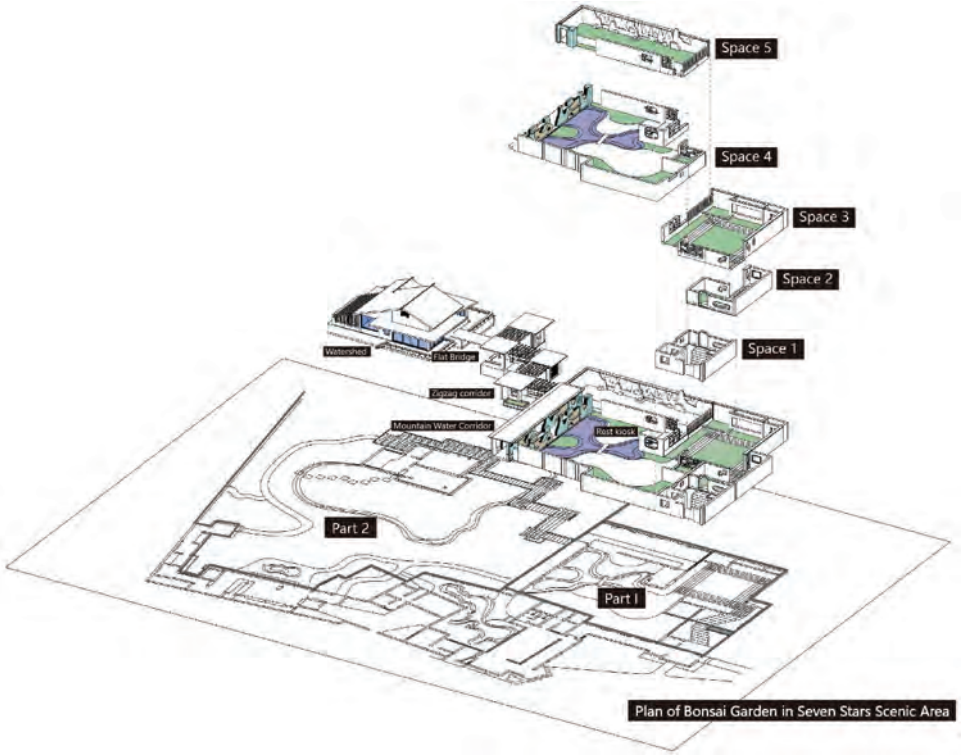


Figure 5. The Bonsai Garden 1–5 space sequence diagram in Seven Star Scenic Area. Produced by the author.

stone columns to enhance the natural atmosphere of the interior (Figure 7).

4.3. External form based on the combination of interior space

The spatial composition is the external shape of the three-dimensional space combination, and Shang Kuo focuses on the symmetry or asymmetry of the landscape building shape. For landscape buildings with simple functional requirements and a small footprint, Shang Kuo usually uses a symmetrical and simple composition. An example is the Qixia Pavilion in Seven Stars Scenic Area, which adopts a symmetrical spatial composition in the middle of the surrounding natural rocks. The pavilion has vermilion columns,



Figure 6. The Water Pavilion courtyard in the Bonsai Garden. Produced by the author.



Figure 7. The open hall on the ground floor of the Reception Room in Ludiyan Scenic Area. From Guilin Architectural Design Office (1982). Reproduced with permission.

a yellow glazed tile roof, tin window panes, a white cloud pattern and sky-blue water-brush stone base color walls, and lattice sided windows shaped like palace lamps (Figure 8).

However, the simple symmetrical geometric composition should not be used for landscape buildings with complex functions, a large base area, and an irregular base. Landscape building in nature usually uses asymmetrical composition with the laws of compositional form and beauty, which make it easier to achieve unity with the surrounding environment (Figure 9).



Figure 8. The Qixia Pavilion in Seven Stars Scenic Area. Produced by the author.



Figure 9. Asymmetrical composition of the landscape building in Ludiyan Scenic Area. From Guilin Architectural Design Office (1982). Reproduced with permission.

5. Creation of facade compositions of various architectural styles

The facade composition of a building is crucial in determining its final style and stylistic characteristics, and the Guilin landscape building designed by Shang Kuo presents a variety of facade composition styles. The Beaux-Arts system, represented by Julien Guadet (1834-1908), followed different styles. According to Alan Colquhoun (1921-2012), "composition" is a method that establishes universal design rules for all styles and does not refer to any particular style (Colquhoun 1991).

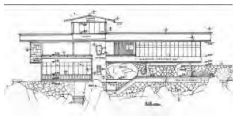
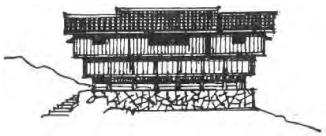
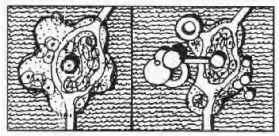
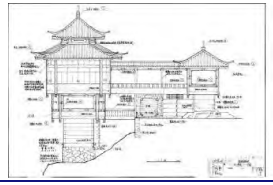
According to Shao (2017), Shang Kuo's design concept is "pattern shaping," which specifically refers to the separation between the internal arrangement of the building and the exterior form. The building plan is designed based on the actual living needs, while the building "form" becomes a kind of "wrapping paper" that can be chosen at will by the owner. The Beaux-Arts system is open to forms (Colquhoun 1991).

The landscape building designed by Shang Kuo has a variety of stylistic characteristics, but its style depends on the human history and natural landscape of the environment where the landscape building is located, The landscape building is combined by drawing on traditional garden or residential architecture, natural form masters and other compositional elements in whole or in part (Table 1).

However, the composition of the exterior form of Shang Kuo's landscape building is not separated from the interior, but is the result of mutual coordination and unity with the interior space of the building (Shang 1980; 1999).

For example, in the design of the Water Pavilion in Ludiyan Scenic Area, Shang Kuo drew on the layout of traditional garden architecture and solved the problem of the vertical height difference from the Fanglian Mountain to the Fanglian Pond by combining of pavilion, corridor, and the main body of the water pavilion (Figure 10). At the same time, to solve the problem of

Table 1. Analysis of the facade composition of landscape building.

Name	Architectural façade composition	Prototype of Architectural facade composition	Live Photos	Design Feature
1. The Waterside Pavilion in Ludiyan Scenic Area				The Water Pavilion was "transplanted" from the traditional garden building "dry boat" and the residential building with an attic.
2. The VIP Reception Room in Ludiyan Scenic Area				The VIP Reception Room "transplanted" Guangxi Longsheng's "hemp column building", using large eaves, large overhangs, hollowsand other composition techniques of Zhuang residential architecture in Guangxi.
3. The Waterside Pavilion in Shan Lake Scenic Area				The Water Pavilion adopts a simple "circular" motif, echoing the shoreline of the lake and harmonizing with the surrounding environment.
4. The Bonsai Garden water pavilion in Seven Stars Scenic Area				The Water Pavilion echoes the Tuofeng Tea Room (left Figure) in the garden and draws on the long and short sloping roofs of the cottage by the stream in Dongyang Lu Residence Town (right Figure).
5. The Bixu Pavilion in Seven Stars Scenic Area				The Bixu Pavilion draws on the compositional form of the Chengyang Bridge in Sanjiang, Guangxi, and combines traditional architectural forms to evoke the mood of the immortal cave among the clouds at Seven Stars Rock.

Sources: Institute of Historical Research (1984), Guilin City Construction Archives Management Office, Guilin Architectural Design Office (1982), Author, Shang (1978, 1980), Wang and Zhou (2004). The Landscape Teaching and Research Office of the Architecture Department(1986,258).

vertical circulation inside the building, Shang Kuo enlarged the mezzanine of the staircase of the water pavilion as a resting platform for viewing. The architectural form continued to coordinate with the form of traditional boats, partially adopting the composition of traditional residential pavilions and elements combining long and short slopes to coordinate the organization of exterior form and interior space. The architectural form is obtained through the coordination and adaptation of the interrelationship between the internal and external space and is influenced by the functional requirements of the building (Peng 1983), which is the embodiment of the Beaux-Arts system combined with modernist views (Li and Shao 2016).

6. Formal beauty law of composition

Landscape building seeks to vary from place to place, but follows the laws of formal beauty in composition, thus ensuring that landscape building is aesthetically "seen". Shang Kuo pays great attention to the observance of aesthetic principles in landscape building design, which specifically includes Harmony and Unity, Contrast and Similarity, Balance and Symmetry, Rhythm and Tempo, Proportion and Scale, Layers and Depth, Repetition and Reproduction (Shang 1999). In particular, Shang Kuo's landscape building explores the rules of composition in terms of stability and balance, proportion and scale.

6.1. Stability and balance

Balance refers to a composition with equal weight on both sides of the visual centre. A balanced composition can make people feel comfortable, safe, and stable, and it's an important rule for the operation the composition of architectural forms (Shang 1999). Shang Kuo ensures the balanced composition of landscape building by increasing the height of the accessory building space.

An illustrative example is the auxiliary building of the Waterside Pavilion in Shan Lake, where Shang Kuo uses the waste soil excavated under the main building to build up the height and connects it to the main building by a flying bridge. In the square pavilion of the Bixu Pavilion, the building is flush with the second floor of the pavilion, using the original foundation of the mountain, and then connected by a corridor. A similar compositional relationship is used in the Waterside Pavilion in Ludiyan Scenic Area (Figure 10), where Shang Kuo combines the ancillary building with the higher terrain and connects it to the main building by the corridor and bridge. This ensures that the main building and the outbuilding do not become unbalanced due to the difference in volume, thus creating a balanced composition.

6.2. Proportion and scale

The proportion and scale of the buildings in Shang Kuo's landscape building are determined by their functional requirements, material structure, and aesthetic considerations, adopting appropriate sizes and dimensions that are expressed in the proportional relationship between the plan and the facade. In the plan composition of landscape buildings, the planes of individual rooms adopt different proportional forms based on their functions (Table 2) (Shang 1978). For example, the VIP Reception Room in Ludiyan Scenic Area shows a ratio of 1:√2 in aspect ratio for its large, medium, and small reception rooms. Similarly, the Water Pavilion in the Bonsai Garden also uses this ratio for its reception room, as do the plans for the building's restaurant, guest rooms, and meeting rooms. In addition, ratios of 1:1, 1.618:1, 1:√3, 1:√5, etc. are common in Shang Kuo's landscape building. In the layout of combined planes, Shang Kuo mostly uses ratios of 1:1, 1:√2, 1:√3, and integral multiples of 1:1 (Table 2) (Shang 1978). In the facade composition of the building, Shang Kuo mostly adopts ratios of 1:√2 and 1.618:1 (Table 2) (Shang 1978; Wang and Zhou 2004). Additionally, scholars have found that the Ludiyan Water Pavilion and the Xiangzhou in the Humble Administrator's Garden share similarities in terms of architectural facade and spatial scale (Kang 2019). Shang Kuo's landscape building design places great emphasis on the

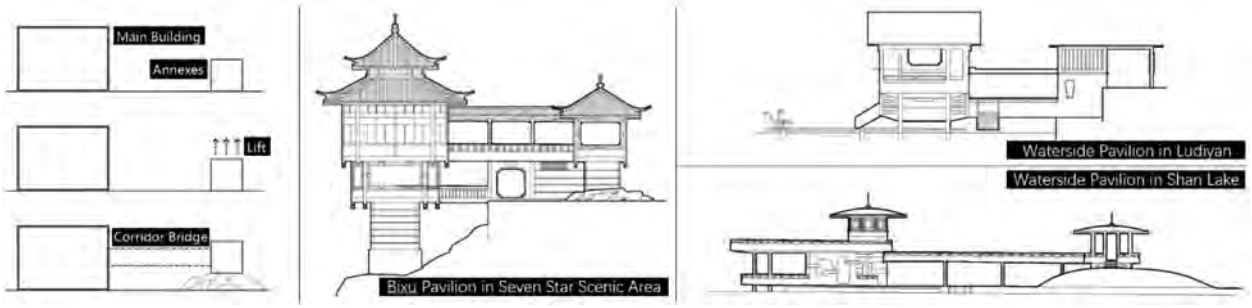
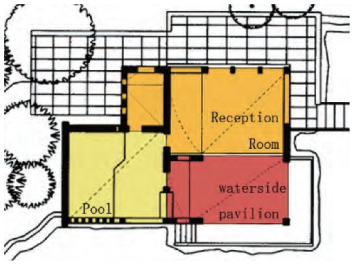
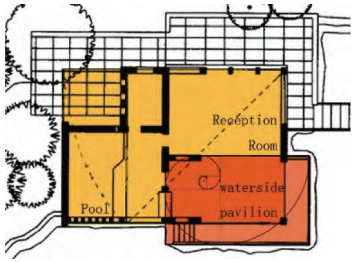
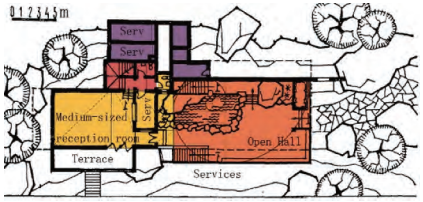
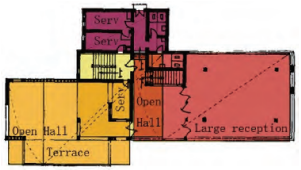
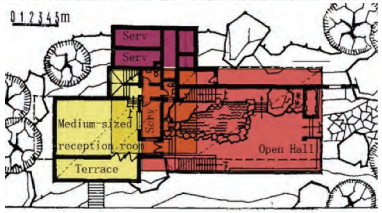
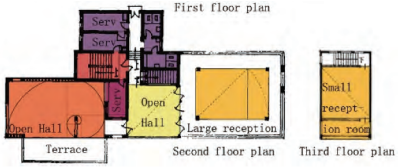
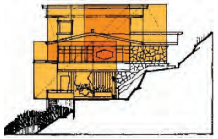
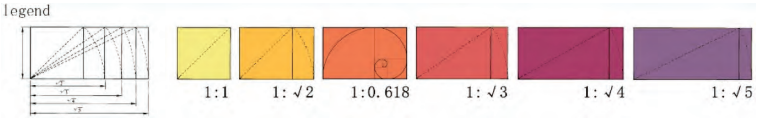


Figure 10. Balanced composition techniques for landscape building. Produced by the author.

Table 2. Scale analysis of landscape building.

Name	Scale analysis of the single space plane	Scale analysis of the combined space plane	Scale analysis of the façade
The Water Pavilion in the Bonsai Garden			
The VIP Reception Room in Ludiyan Scenic Area			
			
			

Sources: Produced by the author based on Shang (1978), Wang and Zhou (2004) with permission.

proportionate relationship between the architectural plan and the elevation.

The relationship between proportion and scale is closely related, with proportion expressing relative scale, while scale is an absolute measure involving specific dimensions and the measure of the scale of architecture and landscape environment objects by human scale. The skillful use of architectural scale in landscape building can influence people's perception of the size of natural objects or spaces. Traditional Chinese gardens are adept at using "big in small," creating a large landscape in a small space, a clever use of scale. For example, the Qixia Pavilion at the entrance to the Qixingyan Cave uses the principle of "when the pavilion is small, the cave is wide, and when the pavilion is large, the cave is narrow" (Figure 8) (Shang 1999). In order to naturally create a framed view, and the height of the bottom floor of the Water Pavilion in Ludiyan Scenic Area is reduced to 2.8m to achieve a sense of scale with traditional garden architecture. Overall, in Shang Kuo's landscape building, the water pavilion and its supporting Fanglian mountain ridge are suitable for the main and secondary, with the WaterPavilion being light and flexible while the mountain remains lofty and upright.

7. Discussion and conclusion

Shang Kuo's landscape buildings in Guilin continues the "composition", "elements", and "primary rules" of the Beaux-Arts, while integrating Western modern architecture and exploring the expression of regional characteristics. As an extension and development of "composition", "spatial composition" not only retains the core of "composition", which is the combination of all parts of the building into a whole, but also incorporates "space" into "composition" (Feng and Wu 2008). By incorporating "space" into the scope of "composition", it expands the content of "composition" as an architectural design method (Wang and Zhou 2020). Thus the theory of composition developed from two-dimensional space to three-dimensional space, emphasizing not only the external block of the buildings, but also the volume and interior space of the building, which is the fusion of the Beaux-Arts and the "space" of Western modern architecture (Min and Lu 2013). The spatial composition of landscape buildings is mostly asymmetrical, emphasizing the extension of the building to the exterior nature and the combination of natural elements in the interior space. However, the plan layout still follows the general axis relationship of "Left-right", "One-shaped", and "Cross-shaped". Shang Kuo's exploration of the incomplete symmetrical balanced layout in the Beaux-Arts's plan composition, as suggested by Qian, Ni, and Yue (2023) suggests, is due to the architectural need to respond to irregular sites and real urban environments. The Beaux-Arts axis has evolved from early primary and secondary axis symmetry to asymmetrically balanced layout axis and extended axes based on functional flow (Qian, Ni, and Yue 2023).

Furthermore, architectural composition adheres to the aesthetic rules of composition such as stability, balance, proportion, and scale. Shang Kuo's landscape building in Guilin demonstrates the mutual adjustment of architectural facade composition and spatial composition guided by function, with the Beaux-Arts as a means of artistic and aesthetic creation that seeks the perfection and harmony of flat facade architecture. Shang Kuo's understanding of "spatial composition" and "planar composition" also reflects functional and environmental considerations, showing the adaptive changes of the Beaux-Arts under the influence of modernism.

At the level of "elements", Shang Kuo's Guilin landscape building presents diverse styles and types, mainly through the integration of traditional Chinese residential or garden architecture, traditional culture and art, and nature. This creates a context that resonates with the overall atmosphere of the local environment and expands the possibilities for expressing regional characteristics (Figure 11). It also shows the gradual emergence of the advantages of traditional Chinese architectural elements in the "composition" of the Beaux-Arts (Wang and Zhou 2020). Based on Shang Kuo's notions of landscape building, this study analyzes the characteristics of typical cases of landscape building in Guilin and reflects Shang Kuo's exploration practice in the process of localizing of Beaux-Arts. Shang Kuo's exploration path is different from the use of Beaux-Arts composition and modernist methods seen in the designs of Yang Tingbao before the 1960s (Gu 1989). Instead, it represents an organic fusion. In contrast to the works of Huang Yulin in the 1950s (Qian 2014), Shang Kuo's designs show a greater integration of Chinese local elements and a more flexible use of axial systems. This reflects the unique findings of Shang Kuo's localized exploration.

However, due to Shang Kuo's death, this paper can only summarize and analyze most of Shang Kuo's landscape building in Guilin as a whole on this basis, basically presenting design history, site photos, and models related to Shang Kuo's landscape building, and organizing more comprehensive data on Shang Kuo's landscape building in Guilin.

Then, the study only analyzes the typical works of Shang Kuo and does not cover the analysis of architectural structure, materials colors, etc. In terms of research rigor, the study should cover all aspects of Shang Kuo's cases and cross-check them through comprehensive case studies. At the same time, the development of the localization of the Beaux-Arts is the

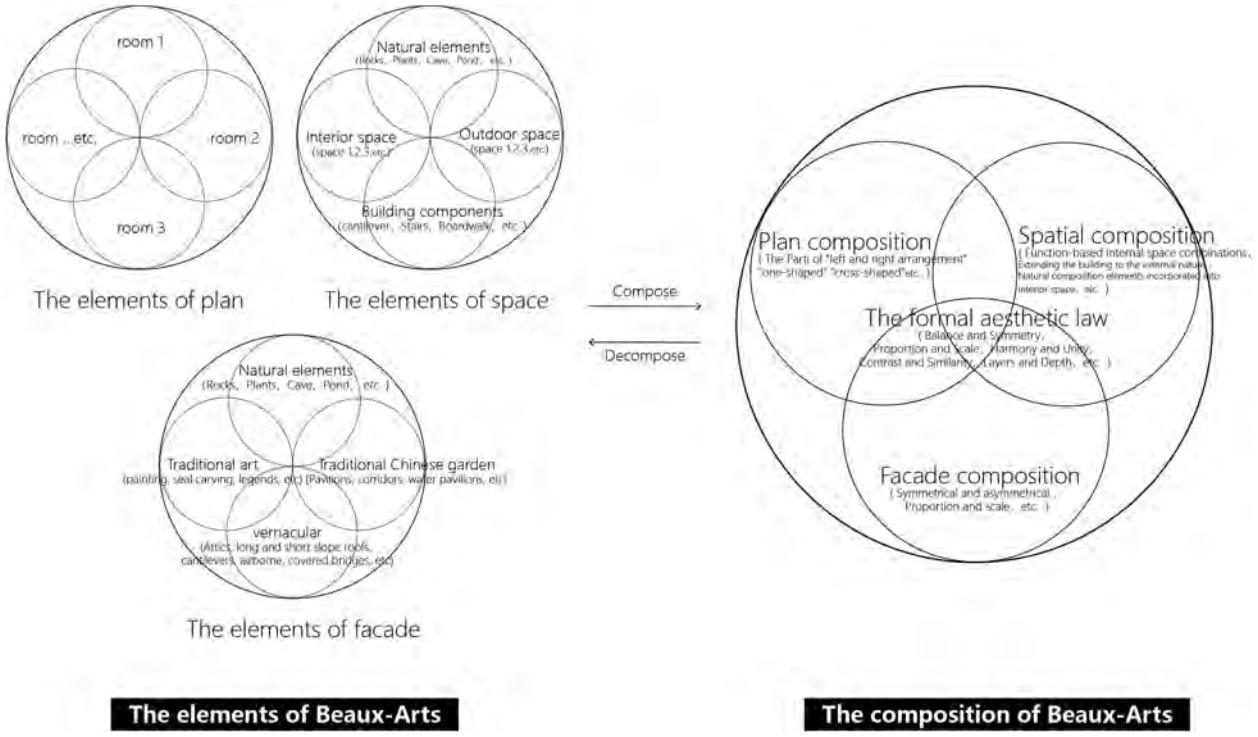


Figure 11. Balanced composition techniques for landscape building. Produced by the author.

result of the efforts of many generations of architects, but there are relatively few studies on the interpretation of designers from the perspective of the Beaux-Arts at present, so we can conduct studies on the exploration paths of several representative architects, as well as horizontal comparisons between different architects to highlight the differences between architects. In the future, we can conduct studies on the exploration paths of several representative architects and horizontal comparisons between different architects to highlight the similarities and differences between the exploration paths of different architects.

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