

A Study on Strategy of Coordinative Symbiosis between New and Old Buildings: Case Study of Shanghai Citic Plaza and Surroundings

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Abstract—Along with the acceleration of Chinese urbanization, the expansion, renovation and demolition of old buildings is on the stage together with the design and construction of new buildings every day in downtown of the old city area. The coordinative symbiosis between new and old buildings is an important problem which needs to be solved in the process of urban development. By studying and analyzing the case of Shanghai Citic Plaza and surroundings, this paper contributes to discussing the concept, value and problems to be solved of the coordination of new and old buildings, meanwhile, striking the balance between new and old buildings from the aspects of architectural form, space, function and local context. As a result, the strategy of the coordinative symbiosis between new and old buildings is summarized, which can offer some guiding principles to urban development from now on.

Keywords—Coordinative symbiosis, new and old buildings, Shanghai Citic Plaza, strategy.

I. INTRODUCTION

SINCE 1980s, urban construction in China comes into a period of rapid development, which brings up astonishing amount of constructions as well as many inevitable problems. Those old neighborhoods and old buildings holding both rise and fall of the city in the past, could hardly disguise all the vicissitudes they have experienced or even stand in the new social environment. Under such circumstance, old city renewal is gradually taking the place of expanding construction as the main topic of urban development. Normally, city updating works as the metabolism in human bodies: architectures are always in a situation of transforming ever since man learned to build. On one hand, social development, economic growth and technical innovation impel people to build a great number of new buildings to meet their needs. On the other hand, irresistible natural forces such as environmental erosion and time transition, together with inexorable social forces as ideological shift and economic demands make architecture degenerate to the old, and then submerge in the process of urban development. However, the self-renewal rhythm of cities is broken by the fleeting progress of modern social development. Facing the conflicts between traditional architectural environment and new architectural form, and the contradiction between old architectural form and new social values, only could coordinate the relationship between new and old buildings activate the old streets. The new and old buildings

this paper discussing about is a relative concept, which asks the time buildings constructed has a certain difference, meanwhile, the geographical position of them should stay within a certain range. Also, the paper only focuses on the distinction of buildings' age, rather than prescribing a limit to their function and scale. Based on the analysis of Shanghai Citic Plaza and surroundings, this paper explores the renewal strategy of coordinative symbiosis between new and old buildings from the aspects of new architecture design and old building renovation.

II. BACKGROUND FOR RESEARCH

A. Concept of Symbiosis

'Symbiosis' was originally used in biology, which means any type of a close and long-term biological interaction between two different species. It was Kisho Kurokawa who first brought up the philosophy of symbiosis into architecture, which mainly includes the symbiosis between parts and the whole, the symbiosis of different cultures, the symbiosis between history and reality, and the symbiosis of architecture and environment etc. In his view, architecture is not building the principal by itself, but a part of the urban units for a larger range, or a fragment of the evolution from the perspective of time [1]. Modern technology and social life come from the assimilation of historical experience. Therefore, architecture of different ages is holding the same historical foundation, which provides the basis of their symbiosis. The new buildings cyclically alternate with the olds in urban environment as time goes. The interinfiltration and integration of the new and old buildings work as an important component of urban development, which is also the foundation of their coordinative symbiosis.

B. Values of Symbiosis between New and Old Buildings

The pursuit of symbiosis between new and old buildings is not to resuscitate the architecture itself, but to continue the social culture of certain city and show respect for its history. The value of symbiosis between new and old buildings initially lies in the continuation of urban historical context, which is the carrier of both material and spiritual culture for architectural space [2]. The symbiosis helps promote the inheritance of collective memory to protect and sustain the historical context. Furthermore, the symbiosis is of value to amalgamate spatial forms. It focuses on the adaptable updating application of original spatial elements rather than simply complete spatial rearrangement and functional transformation. Finally, the value

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of symbiosis between new and old buildings is embodied in reconstruction of genius loci. As people acquire the nature of architecture experience from 'Genius Loci', keeping spirit of a certain place could be taken as a positive activity, which implies to creatively explain and express the existing spatial spirit under new conditions [3]. The symbiosis inherits the cognitive image of old buildings while furnishing new cognitive images. By integrating the old and new cognitive images together and precipitating them into our experience and memory, the symbiosis prompts the formation of new sense of place.

C. Problems of the Symbiosis to Be Solved

Although the replacement of new and old buildings happens every day in cities, most of them fail to be coordinative due to the numerous contradictions between them, including the conflicts between cultural values and economic returns, the irreparable fault between traditional culture and modern forms, and the disparity between ideology and physical demands [4]. Government and developers taking precedence of economic benefits break the self-renewal rhythm of city development. This causes both the design of new buildings and the renovation of old buildings struggle in balancing between cultural values and economic effects. On one hand, it is hard to unify traditional urban culture accumulated from the development process of architecture and modernism architecture form which makes cities devoid of personality during high-speed urban development. On the other hand, the ideology of architecture under regional cultural characteristics finds difficulty in meeting nowadays material and cultural requirements. Therefore, based on the insurance of both cultural and economic value of architecture, the symbiosis between new and old buildings is attempted to solve two issues: The

contradiction between new form and traditional culture, and the discordance between conventional form and new social demands.

III. CASE STUDY

A. Background

Shanghai Citic Plaza is located in Hongkou District which holds great number of historic buildings and traditional commerce, facing the CBD center which is full high-rises – Lujiazui Area across the river. The project is consisted of a newly constructed complex including an over 200 meters high office building with commercial annex and the renovation of Hongkou Building lied in the north-east corner of the site [5]. Hongkou Building, built in 1927, used to be one of the few top level Western style buildings in Shanghai.

Shanghai Citic Plaza planning site is surrounded by Shanghai old style lanes and alleys, among which Gongyi Lane's Shikumen is the most distinctive architectural form. Such Shikumen residential buildings existed around 1870s, adopting the overall layout of European town house, using Ningbo red stone for gatehouse. To the northeast of the site, Bank of China (Hongkew Branch) of art decoration style, completed in 1932, is facing Hongkou Building across the road. In this case, it is essential to coordinate the relationship among the newly designed commercial and office buildings, Hongkou Building inside the site and the surrounding architectural environment. Meanwhile, the renovation of Hongkou Building could not neglect the coordination between itself and the newly-built complex. As described above, Shanghai Citic Plaza and its surroundings could be taken as a typical case to discuss the coordinative symbiosis between new and old buildings.

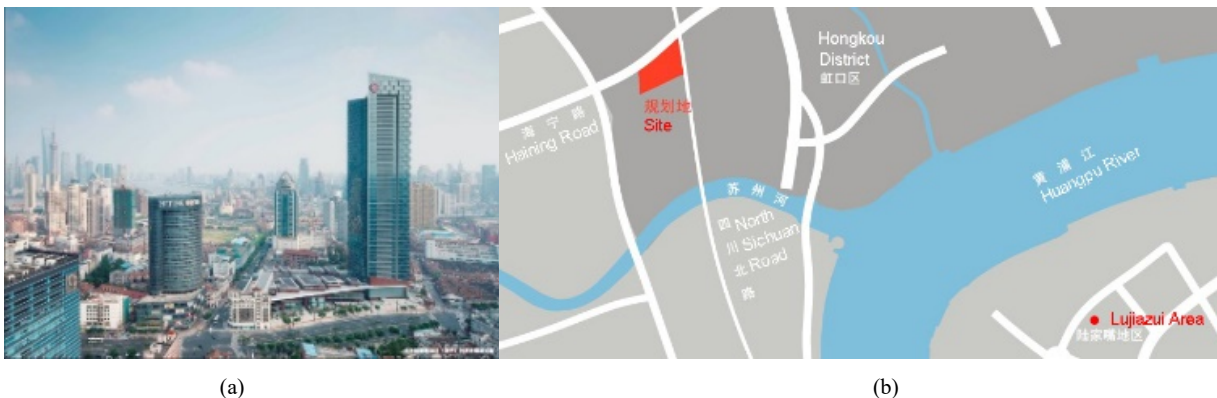


Fig. 1 (a) Bird view of Shanghai Citic Plaza and surroundings, (b) Site location on map

B. Architectural Form

1) Volume and Modulus from the New Buildings

Surrounded by numerous traditional dwelling houses built around 80 years ago, Shanghai Citic Plaza office and commercial complex firstly coordinate with the periphery from the volume [5]. In addition to several exceptional individual buildings, the dwelling houses around the site are mainly three

to four storeys. They are small in volume and closely arranged, forming narrow lanes, which may look disordered, but their texture is quite clear. These are the memory belonged to the city, and interpreting the historical features of the city. To cooperate with the peripheral old volume, Shanghai Citic Plaza abandoned the normal volume of big box for commercial complex, split the whole volume into group of buildings. The approach by breaking up the whole into parts not only caters to

the original context features, but also brings up friendly experienced scale as well as verified spatial form.

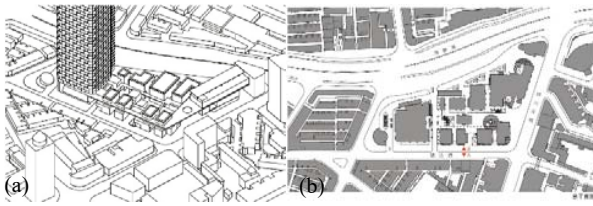


Fig. 2 (a) Axonometric view of commercial annex, (b) Ground floor flat

Secondly, the east part of commercial complex is partly rotated to be parallel to municipal road, taking account of Hongkou Building inside the site. Furthermore, the height of the commercial part is controlled to be one floor lower than Hongkou Building, to keep away from destroying the landmark view of Hongkou Building from the intersection of North Sichuan Road and Haining Road.

Thirdly, based on the investigation of surrounding environment and actual functional demands, a modulus of 4500X4500 is extracted from the two-storey dwelling houses closely arranged south to the site. The south part of commercial complex adopts the modulus, and two-storey pattern to coordinate with urban environment. The modulus is also used in high-rise office building flat, glass curtain, clay pipe surface and other architectural languages.



Fig. 3 (a) South façade of commercial annex, (b) the façade facing across the road



Fig. 4 (a) 200 m long cornice, (b) the hole in it

Finally, an about 200 meters long transverse cornice is set on the height of 20 meters, to weaken the influence of the great

vertical dispersion between the 220 meters high office building and the surrounding neighborhood. It helps to reduce the abrupt incongruity and spatial depression. Besides, a huge circular hole is opened on the cornice, to retain some view of the high-rise building and its volume impact for people inside the commercial complex.

2) Reservation and Reform of the Old Building

The renovation of Hongkou Building in the northeast corner of the site basically persists the previous condition of its architectural form [6]. Having gone through 90 years, the old buildings have been used to connect the entrance of a department store and an overpass at one time, and it has also been used as hotel, staff dormitory and so on. The dark brown machine-made bricks and white pseudo-stone facing, iron guardrails of new artistic movement style, the tower at the corner and the pavilion on the rooftop. These architectural elements which make the building unique are preserved. The south façade of Hongkou Building is facing the new buildings in the site, which is key point of transformation. The new and old buildings stay apart from one to three storeys, and connected on the fifth floor. Naturally, the architectural form of the new buildings is led to the old building. Both old and new architectural form existing on Hongkou Building bring up the collision of architectural culture from different times as well as their coordinative symbiosis under identical regional culture characteristics.



Fig. 5 (a) Photo of Hongkou Building from the intersection of North Sichuan Road and Haining Road before renovation taken on 2012, (b) after renovation taken on 2016



Fig. 6 (a) Photo of the south façade of Hongkou Building before renovation taken on 2012, (b) after renovation taken on 2016

C. Functional Space

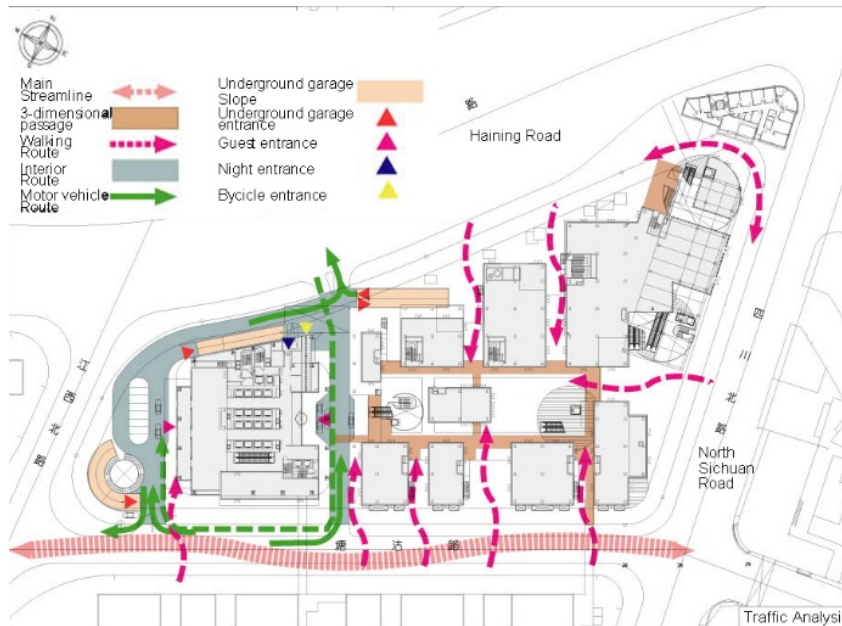
1) Space Design of the New Buildings

The most distinctive space around Shanghai Citic Plaza site is traditional lane space – ‘Linong’, whose high-density and narrow space structure works as an architectural symbol of the area and even the whole city. Correspondingly, similar ‘Linong’ space is naturally formed interluding in the

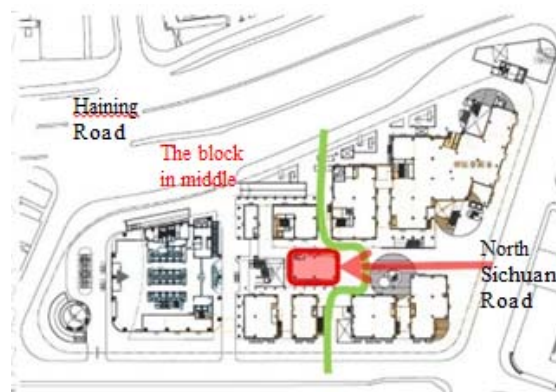
partitioned volume of new buildings, offering multiple traffic lines for choice and permeable sight. Although the height to width aspect ratio of these new 'Linong' space is quite different from the traditional proportional relation, its recognition as 'Linong' space is maintained. Those 'Linong' space is connected by corridors on second and third floor. From the interspace of blocks, both vegetation inside the site and fine scenes of the old city across the street could be held in view. The extension of sight spontaneously coordinates the new and old buildings. The commercial annex has three floors. Under the modern commercial function requests, 'Linong' space is inserted with multiple traffic facilities such as stairs, elevators,

corridors and overpasses, constructing a new-style three-dimensional continuous 'Linong' network together.

The commercial annex manipulates small volume to provide suitable opposite views for the 'Linong' space. The block in the middle of the commercial annex is in the line of the main entrance from North Sichuan Road, working as the visual center. Meanwhile, it works as the opposite view from both north and south lanes, which avoids the crossing sight through the whole site ingeniously. The increased twists and turns to the 'Linong' space act in coordination with the traditional winding lane space.



(a)



(b)

Fig. 7 (a) 'Linong' space formed in commercial annex, (b) the opposite view in the center of the site



Fig. 8 Photos of 'Linong' space in the new buildings

2) Space Reform of the Old Building

Different from retaining a large amount of original architectural form, the interior space of Hongkou Building is totally re-planned. Following the principle of making use of the original structure as much as possible, emergency stairs, elevators and toilets according to the current specifications and operating requirements are set up in the first place. Then, a two-storey high entrance hall on the south side of the building is reformed to prevent the limited space being cramped. Simultaneously, of the same reason and the same position on flats, a three to five floor atrium is put up, offering different spatial experience for the distinct proportion relationship. The fifth floor is connected to the new buildings, and you could go through the three storeys high atrium to the overhead relaxing bar between Hongkou building and the new commercial annex. Both the east and west façades of the bar are using glass curtain, allowing to take a panoramic view of the historical neighborhoods around the site.

Despite of the restriction from the original structure system, taking use of steel structure contributes to make public space flexible. Moreover, the transitional space between new and old buildings links them up, making the coordinative symbiosis expanding from the appearance to the interior space.

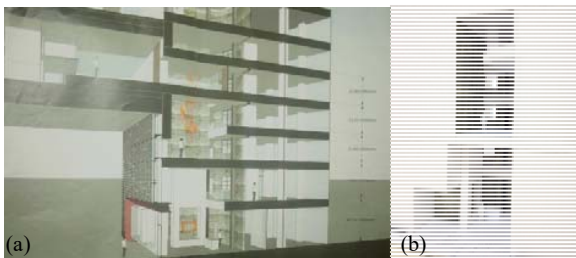


Fig. 9 (a) Section of Hongkou Building reformed model, (b) Space of entrance hall and atrium in reformed model

D. Local Context

1) Boundary Materials of the New Buildings

Traditional dwelling houses around Shanghai Citic Plaza mostly use red brick as the external wall material. In addition, the brick-red color could easily be found from the window frame, roof top and other details. The color conducting as a powerful architectural language has permeated into all the buildings in this area. The brick-red color has become a contextual symbol of this region.

In order to coincide with this contextual symbol, Shanghai Citic Plaza uses two different tones of red clay pipe in the exterior surface. The 60 mm high clay pipe is similar to the

traditional red brick boundary both in texture and thickness. Through well-design of mixed color and treatment such as hollowing out, the new material is coherent with the old. Besides, Shanghai Citic Plaza attempted to inherit the color context in other aspects. The big cornice above is painted into bright red, contradicting to the clay pipe surface. Even in the scaly glass curtain wall of the high-rise office building, red elements are hid into the surfaces of vents, supplementing a bit of vitality to the whole building.



Fig. 10 (a) Clay pipe surface, (b) red surface of vents in high-rise office building

2) Boundary Materials of the Old Building

Typically, renovation of old buildings is inclined to extending local context by choosing different boundary materials. On one hand, the original materials could remind people of the old buildings and local context. On the other hand, modern materials such as glass and steel could bring up a strong contrast and emphasize both new and old materials at the same time [7]. In the case of renovation of Hongkou Building, its south façade is using the same clay pipe surface as the new buildings, which is similar but in different style with the old red brick on the other façades. As to the interior boundary of Hongkou Building, the black brick material on the remained walls contrasts strongly from the texture to the color with the new constructed white painted walls. No matter taking use of the original materials or the new ones, the renovation should always be based to the aim of integrating the new and old culture to form new local context.

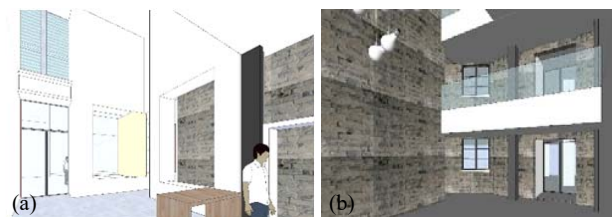


Fig. 10 (a) Material contrasts in entrance hall, (b) atrium on the third floor

E. Brief Summary

The case of Shanghai Citic Plaza and its surroundings takes the urban history, neighborhood features, and its personal identity into consideration together, which prevents the rigid boundary and sharp contrasts resulting from the commonly used technique of large-scale development, between new and old buildings. The case pursues the harmonious coexistence of history and modern through intelligent use of materials and

methods of construction, and interprets the coordinative symbiosis between new and old buildings from aspects of spatial continuity, scale, façade and etc.

IV. CONCLUSION

Based on the study of Shanghai Citic Plaza and surroundings, several strategy of coordinative symbiosis between new and old buildings could be concluded. Above all, it is important for both new building design and old building renovation to extract the essence of architectural image from each other. Full understand of the cultural value of different times is the major requisite for the coordinative symbiosis of buildings from different times. Then, new building design needs to make great efforts to ease the disparity when interpreting the old context by new architectural languages. Moreover, old building renovation should take moderate amount of new language inside to bring about strong but not rigid contrasts. It could help the old building adapt to the new architectural environment while emphasizing its own characteristics.

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