

# Design Strategies for the Renewal of Public Space in Chongming Countryside from the Perspective of Cultural Heritage

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**Abstract:** Cultural heritage and protection is an important part of rural revitalization. Chongming district is a place with special geographical advantages and historical and natural resources in Shanghai. However, after recent investigations, it is found that the cultural heritage and protection of local traditional architecture in Chongming has not been adequately researched. This paper is based on the analysis and abstract of the traditional architectural design elements of Chongming, combined with renewal design projects, hoping to summarize the public space renewal design strategies in Chongming countryside with the characteristics of Chongming, and providing certain reference value to relevant research or design projects in the future.

**Keywords:** Environmental design; Public space design; Cultural heritage

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## 1. Introduction

Chongming district, Shanghai City is located at the mouth of the Yangtze River, with a unique geographical location and natural resources, and has great economic development potential. Chongming's agriculture has gradually developed since the Tang and Song dynasties, and its financial and social status has thus steadily improved, the material and cultural life for local people has also been improved, it has laid the solid foundation for Chongming's rich historical and cultural resources in terms of intangible culture heritage and architecture.

Cultural heritage reflects local culture and tradition and is the basis for building local characteristics and enhancing local identity. However, many projects carried out in Chongming in recent years have not paid enough attention to the cultural heritage and protection. Chongming is important to Shanghai as it has a special location and rich history, but the socio-economic development is falling behind other districts in Shanghai. Shanghai needs to promote and activate the development of Chongming.

This paper is based on architectural and environmental design perspectives, studies the characteristics of

architectural planning and design elements in Chongming, and combined with renewal design projects, trying to explore the design strategies for the renewal of public space in Chongming countryside under the context of culture heritage and protection, hoping to activate the development of Chongming and protect its historical and cultural at the same time, as well as providing certain research value for relevant researches and design projects in the future <sup>[1]</sup>.

## **2. Analysis of planning and design elements of Chongming traditional buildings**

### **2.1. Planning**

The planning of traditional courtyard houses in Chongming is divided into one-tier type, two-tier type, three-tier with two atriums type, and four-tier with three atriums type <sup>[2]</sup>. Such as Shanghai's outstanding historical building, Ni Baosheng's residence and Chongming Confucius Temple which was built in the Yuan Dynasty, were both four-tier with three atriums type planning. These are the most representative buildings in Chongming and reflect the characteristics of the traditional courtyard house planning in Chongming.

The representative planning of the four-tier with three atriums is made of four layers of houses and three enclosed atriums, which are enclosed by the surrounding houses to form a wellhead space for natural lighting, ventilation, and drainage <sup>[3]</sup>. By the traditional concepts of "Heaven and man are united as one" and "water resembles wealth," the sloped roofs around the atriums are gradually developed into the form of sloping to the atriums more and sloping to the outside less, which introduces more rainwater into the atrium, and then placed water collection devices in the atrium to fulfill the traditional concepts. This kind of traditional courtyard house planning is called "Sishuiguitang" which means water from four directions returns to the middle of the courtyard house, and it has been widely applied in recent Neo-Chinese style buildings <sup>[4]</sup>.

### **2.2. Design elements**

Traditional design elements have their characteristics that reflect the development and environment of society at that time. Due to geographical differences, the same region may show different expressions in the use of traditional design elements <sup>[5]</sup>. For example, many fishermen lived in Chongming, while they tended to live by the river because of the convenience of fishing, and they began to build houses to protect themselves from the storm by using local and easy-to-get materials and in the shape of arches. As a result, a kind of traditional dwelling "Huandongshe" was gradually formed and reflected the way of life of the local fishermen in Chongming in the last century.

In addition, the textile industry is well-developed in Chongming, and the textile households need their dwellings to be open and well-displayed because they live and produce in the same space. Whereas Chongming is windy and rainy, the textile household designed a kind of door and window form in order to avoid the bad weather, "Yichuangyita" was therefore formed, and also reflects the way of life of the textile households in Chongming.

## **3. Abstract of the planning and design elements of Chongming traditional buildings**

### **3.1. Abstract of the planning elements**

With the development of the ages, the traditional courtyard house planning "Sishuiguitang" has evolved a lot of new expressions, the spatial combination and the material application have also changed a lot compared with the

past. However, the core design elements that constitute its special space feel remain the same<sup>[6]</sup>. In this paper, the author extracts the core design elements that comprise the planning of “Sishuiguitang” as follows.

### **3.1.1. Atrium**

The atrium often lays in the central axis of the entire courtyard house, surrounded by the houses and enclosed to be a wellhead space. The wellhead shape is diverse, like rectangular or round shapes, even in irregular shapes, and the atrium is an open, transition leisure space in the courtyard house<sup>[7]</sup>. Water collection devices, waterscapes, or pools can be placed in the middle of the atrium to fulfill the concept of “Sishuiguitang” and “Heaven and man are united as one,” therefore, the water-relevant devices are the core design elements during the design process of the atrium.

### **3.1.2. Surrounded constructions**

In a traditional courtyard house, the atrium space is usually formed with three sides of surrounded buildings, and the sloped roof of the surrounding buildings guides rainwater into the atrium, combined with the water collection devices in the atrium to build a space under the concept of “Sishuiguitang”<sup>[8]</sup>. Recently, besides using buildings to enclose the atrium, other design cases also trying to use corridors or connecting hallways to form the atrium space, building a semi-open and circle traffic flow to provide a sense of leisure and tranquility, which is especially common in the new design projects.

### **3.1.3. Decorated components**

Decorated components such as openwork designed windows, which are used for natural lighting, ventilation, and wall decoration, tiles, and eave tiles for guiding rainwater, paving stones, and decorative ceilings, beams, pillars, and columns, all together form a courtyard house space with traditional Chinese characteristics<sup>[9]</sup>.

## **3.2. Abstract of the traditional design elements**

### **3.2.1. Traditional dwelling “Huandongshe”**

Chongming Island is located at the mouth of the Yangtze River, and along the river, reeds are easier to find than wood. Thus, local fishermen tend to use local materials like reeds to build their shelters. They tied reeds into bunches, bent the bunches to semi-circular, and inserted both ends into the ground to build an arch or dome-shaped structure and then covered reeds and waterweeds onto the top of the structure as the roof<sup>[10]</sup>. From this, the semi-circular, arch-shaped architectural form of the traditional dwelling “Huandongshe” was designed. It is not only a result of the theory “round sky and square earth” but also due to the weather in Chongming, where streamlined structures can better cope with the storm<sup>[11]</sup>. From the above analysis, it can be seen that the typical design elements of the traditional dwelling “Huandongshe” are arch-shaped structures, bunch-shaped façade, native materials, and many more.

### **3.2.2. The door and window form of “Yichuangyita”**

In the countryside of Chongming, most of the habitants make their living in the textile industry, and their houses are relatively small with windows that lead to the natural lights being relatively small too and with single lighting direction, and are often in the bedroom-kitchen layout. Due to the stormy weather in Chongming island, they tend to place the looms or other textile machines in the kitchen, while moving the machines outdoors when cooking. From this, the textile households designed a kind of door and window form called “Yichuangyita” to meet their needs of easily carrying things indoors or outdoors<sup>[12]</sup>. In their design, the door frame is divided into two parts: one

is a door, and the other one is a half window on the upper side and half still board like a small door on the lower side. The door part and the window-board part can be opened together to provide a large doorway for carrying equipment, while on stormy days, it can be closed together with only the upper window part opened to ensure the natural light and prevent the wind and rain at the same time. This kind of door and window form was still in use in Chongming until the 1980s<sup>[13]</sup>.

## 4. Application of the planning and design elements of Chongming traditional buildings

The traditional courtyard house planning of “Sishuiguitang,” especially the typical atrium design is widely applied in Chongming in both historical buildings and new-designed buildings. The traditional dwelling “Huandongshe” and the door-window form “Yichuangyita” are unique design elements that characterized Chongming, but the “Huandongshe” was almost extinct in the 1950s, and the “Yichuangyita” can rarely be seen due to the impact of modern design styles, although it still existed until the 1980s. Also, the academic fields and design fields paid inadequate attention to these two elements and have little research achievements. Based on the design strategy of cultural heritage, this paper expects to build a diversified and unique architectural space with Chongming’s characteristics through in-depth study, detailed analysis, and design application attempts<sup>[14]</sup>. The following projects are based on the current building in Yuxi Village, Chenjia Town, Chongming District.

### 4.1. Project 1: application of the planning elements

This project is an attempt to apply the atrium design concept of “Sishuiguitang” to the redesign process of the current building to create a modern courtyard-house-like villagers’ center. In the planning design, more attention has been paid to the design process of the atrium. Typical design elements like connecting corridors have been applied to create the semi-open atrium space, a square waterscape has been placed in the central axis of the atrium to build a tranquil transition space, and the sloped roofs of the corridors are designed under the concept of “Sishuiguitang,” which both ensure the atrium to be designed with traditional characteristics as well as in a modern way. During the design process of courtyard walls, native materials that have often been used in traditional Chongming buildings like tiles and lattice were also been applied to fulfill the feelings. Openwork window is a typical traditional design element in Chongming and even in the whole Yangtze River Delta, this kind of decorative window has been designed into a plum blossom shape and applied in this project to beautify the wall as well as improve natural lighting and ventilation. Columns, beams, and pillars were well-considered too, using different materials and details to show both modern and traditional design styles (see **Figure 1**).



**Figure 1.** The atrium and the connecting corridor (author’s design)

This project discussed the combination of “Sishuiguitang” and the villagers’ public center, using native materials and special design elements that are based on traditional concepts to create a unique local public space.

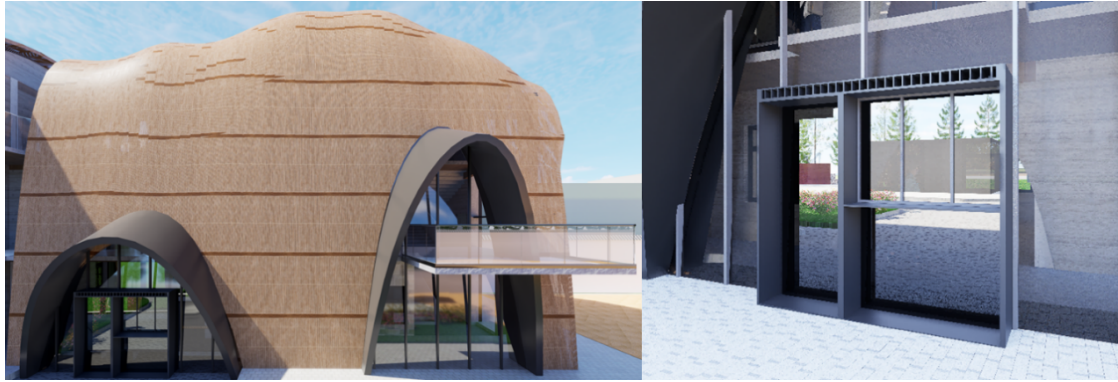
#### 4.2. Project 2: application of the traditional design elements

This project is trying to re-design the current buildings into villagers’ centers and combine the traditional design elements that were studied above to create a unique public space with Chongming characteristics. Yuxi Village, Chenjia Town is on the east side of Chongming Island, close to the East China Sea, where the local inhabitants are mostly fishermen. Accordingly, the design elements of traditional fishermen’s residence “Huandongshe” have been taken into the façade design process, such as the application of an arch-shaped structure, creating a visual center of the whole community as well as different from the surrounding residential buildings, and also awaking the memory of the fishermen to enhance the sense of belonging (see **Figure 2**).



**Figure 2.** Main elevation (author’s design)

During the façade design process, the concept of continuing the texture of the old dwellings was taken into account, while considering the durability of reeds and waterweeds, native materials like bamboo material which also represents Chongming and is bunch-shaped is more appropriate. Bamboo weaving façade in the same traditional tone and texture, combined with the arch-shaped architecture, brings the feeling of “Huandongshe” to the fishermen in a modern design way. At the entrances of the building, the door-window form “Yichuangyita” has been applied as the doorway. Replacing the original wooden door-window frameworks with metal frameworks, and enlarging the width of the window by using a triple-folding window structure, introducing more natural lights as well as remaining the original design purpose. Moreover, several arch-shaped glass curtain walls have been applied to continue the overall design element, to make the whole building in a harmony and unified design language (see **Figure 3**).



**Figure 3.** Façade details and door-window details (author's design)

This project discussed the attempt to create a public space that characterized Chongming by combining “Huandongshe” and “Yichuangyita” design elements, hoping to provide certain references to the local inhabitant-oriented design projects.

## 5. Conclusion

Chongming is an important part of Shanghai in terms of economic, cultural, and agricultural. However, during the investigation and research process of Chongming's traditional architecture and cultural heritage, it is found that a lot of precious traditional buildings, culture, and design elements are gradually disappearing from people's lives <sup>[15]</sup>. At present, China attaches great importance to rural revitalization and cultural heritage as well as historical protection, and remaining loyal to cultural heritage and historical protection in innovation has become an important issue to the design field in the new era. Thus, the inheritance, protection, and development of Chongming's characteristics in terms of environmental design and architectural design should be carried out promptly <sup>[16]</sup>.

This paper analyzes and abstracts the unique design elements in Chongming, and summarizes the core design elements that consist of courtyard house planning “Sishuiguitang,” traditional dwelling “Huandongshe,” and door window form “Yichuangyita” combines two redesign projects towards a current building in Yuxi Village, Chenjia Town, trying to explore the public space design strategy based on the studies of Chongming characteristics thought the reapplication and integration of the design elements. Therefore, hoping to provide a certain research basis for relevant design projects and research as well as protect the local history and culture, and finally promote the development of Chongming.

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## Disclosure statement

The authors declare no conflict of interest.

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