

Research on Landscape Remolding of Urban Industrial Wasteland: A Case Study of Hangzhou Iron and Steel Works Site

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Abstract: Hangzhou Iron and Steel Plant, as a typical representative of Hangzhou's industrial culture, is one of the most important city marks for Hangzhou people. But now it has been abandoned and become the shackles of Hangzhou's urban development. On the city's industrial landscape remaking research, site analysis of complex potential factors, draw lessons from traditional classical gardens landscape charm, retain the native site information, consider the experience of people in space, describes memorial park landscape construction, satisfy people for entertainment, history and culture, the demand of the ecological natural, In this way, the harmony among site, nature and human can be achieved, which is expected to help Hangzhou Iron and Steel Plant revitalize and regenerate, and also provide reference for the research of landscape remolding of urban industrial wastelands.

Keywords: Industrial wasteland, Landscape remolding, Industrial landscape, The ruins of Hangzhou Iron and Steel Plant

1. Introduction

With the rapid development of the economy, the urban industrial structure began to adjust, so that traditional industries were gradually replaced. The rise of the concept of environmental protection has made people aware of the importance of the environment and the requirements for the environment have been continuously improved. Under the influence of both, the industrial depression in the city has led to the transformation of heavy factory bases in many cities, and the original production sites have been relocated, so a large number of industrial wastes have appeared in the city. Although the relocation of the factory has a positive impact on the improvement of the environment, the original environmental pollution problem has yet to be solved, and if the urban industrial waste land is not reasonably and effectively treated, it is also a waste of urban land and shackles the development of the city.

Established in 1957, Hangzhou Iron and Steel is a symbol of Hangzhou industry and has achieved brilliant achievements, but due to the relocation, the original site fell into a state of idle and abandoned. The influence of Hangzhou Iron and Steel on Hangzhou people is far-reaching, and it is one of the most important urban memories and an integral part of urban culture in Hangzhou. Therefore, in the planning of the Hangzhou North plot in 2015, Hangzhou Iron and Steel was included in the "Hangzhou Municipal Government's Air Pollution Control Plan" and the "post-G20 era" relocation and transformation directory, so the protection and reuse of Hangzhou Iron and Steel began to attract great attention from residents.

Based on the analysis of the current situation of Hangzhou Iron and Steel, this paper reshaped and restored its landscape through the inspiration of landscape architecture, so as to wake up the abandoned industrial land, give it vitality and vitality, and carry out the research on landscape reshaping, with a view to providing reference experience for the urban construction and development of traditional industrial areas in China[1-2].

2. The Explanation of Industrial Wasteland

2.1. Industrial Wasteland

Industrial wasteland refers to the land damaged or abandoned in the process of completing industrial production, and the main reasons for its occurrence are: (1) Rapid urbanization expansion, industrial adjustment, difficult factory expansion and transformation, new factory site is selected for relocation,

and the original site is abandoned. (2) Resource-based mining industries such as mining have rude exploitation of resources and backward mining technology, resulting in ecological damage, land pollution, and the formation of mining wasteland. Third, due to the continuous penetration of concepts such as sustainable development, traditional industries do not meet the requirements of society due to backward production technology and single production type structure, forming industrial wastelands.

2.2. The Shaping and Protection of Wasteland by Post-industrial Landscape

2.2.1. The Concept of Post-industrial Landscape

Post-industrial landscape refers to the "landscape after industry", which refers to the landscape shaped by the transformation of industrial sites that were originally industrially produced and then abandoned. Its transformation method is scientific, not all denied and rebuilt, but reserved transformation and reuse. Through the reorganization of industrial elements, the transformation of old things, and the regeneration of new things, a landscape integrating industry, ecology and humanities is formed.

2.2.2. The Model of Post-industrial Landscape Shaping

The models of post-industrial landscape have their own advantages and characteristics, and each model is still improving and developing, which can be combined with each other to transform and protect our industrial heritage. After shaping the industrial landscape, the abandoned industrial land will become the urban public space needed by the public, such as landscape parks, exhibition museums, and creative industry Spaces. The original production of abandoned industrial land caused environmental pollution, and its main means was ecological restoration. For example, the Medrich Iron and steel plant, land and other natural elements were polluted. Petrac designed and restored it, retained site information, absorbed land art ideas, and applied modern technology. Make it a North Duisburg landscape park with a variety of activities such as Tours, dining, sports, gatherings, leisure and entertainment. If the industrial wasteland retains a complete production process and equipment, it can be transformed into an industrial exhibition museum according to the site conditions, such as Shenyang Foundry Museum, which retains the historical site information of the original foundry workshop, presents its seven major casting technology, and uses modern technology to reproduce the scene of workers' production, which can be described as a living dynamic industrial heritage. Industrial wastelands can also be replaced by functions. As the industrial historical information is favored by artists, the commercial and artistic value of the wastelands can be enhanced by artistic means, thus transforming the wastelands into creative industry Spaces. For example, Beijing 798 Creative Park integrates contemporary aesthetic orientation and gathers different artistic elements while respecting the original site. It attracts people from different walks of life in the arts. In addition to the above modes of transformation of the post-industrial landscape, there are also catering and hotel modes, residential modes, shopping malls, stadiums and so on.

3. Reference and Shaping of Post Industrial Landscape Models

3.1. Analysis of Hangzhou Iron and Steel Works Site

3.1.1. The Time Potential

Hangzhou Iron and Steel is located near the middle of the mountain. Banshan, originally known as Gaoting Mountain, is commonly known as Banshan due to the folk belief of Banshan Niangniang during the Southern Song Dynasty, where a Banshan Niangniang Temple was built. After the founding of the People's Republic of China, the surrounding area of Banshan was planned by the people's government as a heavy industry development zone. In the 1950s, a group of large and medium-sized state-owned heavy industrial enterprises such as Hangzhou Steel and Hangzhou Glass were established in the mountainous area. Hangzhou Iron and Steel Plant has gone through a total of five periods. The initial stage of construction from 1957 to 1960; From 1961 to 1966, it entered a period of adjustment and recovery; Normal development from 1977 to 1994; Rapid development from 1995 to 2015; In 2015, it was shut down for transformation and upgrading[3-4].

3.1.2. The Spatial Potential

The area where Hangzhou Iron and Steel is located spreads around the north-south Maling Mountain, and the terrain is relatively flat, all of which are distributed with dense forests. The industrial properties of urban fabric are not obvious, and the texture is mainly green texture dominated by dense plants and light tan texture dominated by soil, and the texture of industrial buildings and industrial structures shows

a degrading trend. Internally, that is, the traffic is mainly dirt roads, the penetration between roads is insufficient, and the main and secondary roads are not clear, resulting in hindrance to the communication between nodes. Due to the different industrial production links, industrial structures have a variety of forms, such as linear pipeline space for transmission, columnar cylinder space for storage, etc.

3.1.3. Material Potential

Hangzhou Iron and Steel is mainly characterized by staggered factory buildings, towering chimneys, and numerous blast furnaces, and the steel industry has remarkable characteristics. Iron-making, coking, sintering, steel rolling and other links have distinctive characteristics. The factory area now retains an iron-making blast furnace, a coke oven, an upright furnace, three large-volume gas storage tanks, chimneys, production and processing workshops and warehouses, most of the buildings are 20th century 60s brick and wood structure, the style is a combination of Chinese and Western, the outer wall of the factory building due to different periods of renovation and repair, the facade is painted with red lacquer, while retaining different styles of windows and skin texture(Fig.1).



Figure 1: Current Situation of the Remains of Hangzhou's Half Mountain Iron and Steel Industry

3.2. The Thinking about Design

Analyze the existing information of the site, combine and construct elements, and preset the effects of its operation. The renewal of abandoned land should pay attention to the combination of the site and spiritual space, narrate the story of the site well, express the ideas of the space, in order to bring visual richness and spiritual resonance to people. In order to create a good natural landscape and better maintain the value of industrial heritage, the nearby industrial area centered on Maling Mountain in the steel factory site was selected as the abandoned industrial landscape shaping site. The site has an inverted "7" shape, and the main industrial heritage in the site includes two transportation tracks and a left over building complex, as well as a white egret protection base mainly based on Maling Mountain. The industrial building complex is located at the foot of the southern part of Maling Mountain, with a centralized distribution. Two railway tracks are distributed on the southwest side of the building complex, in an east-west direction, presenting a "two" shape (Fig.2).



Figure 2: Conceptual diagram of Hangzhou Iron and Steel Memorial Site Park

3.3. The Landscape Reshaping

The Hangzhou Iron and Steel Memorial Site Park is roughly divided into three parts: the mountain and forest area with Maling Mountain as the main body, the cultural and creative area with industrial architectural heritage as the main body, and the industrial memory area with two railway tracks as the main body. On the basis of retaining the most original material of the site, the original architectural facilities and cultural heritage of the site are protected to the greatest extent, and the original logic of the site information is obeyed, and the site is transformed to a minimum extent, so as to achieve the maximum landscaping[5-6].

3.3.1. Mountain and Forest Areas: Combining Movement and Tranquility, Self-enjoyment

Maling Mountain runs north-south, with a "one" shape from the overlooking Angle and an irregular "M" shape from the side perspective, with two relatively gentle mountain heads. The concept adopted by the mountain forest area is the combination of static and dynamic, and it is happy. The mountains in the north are moving, and the mountains in the south are quiet. The northern hill, close to the residential area, surrounded by schools, etc., has a large number of people, set up industrial play areas for children and adult gyms, reuse discarded industrial materials, create sports equipment and amusement facilities, shape micro-terrain suitable for children's play according to the original terrain, and build industrial toy space. To the south of the mountain, the higher elevation, is a better observation point to observe egrets roost, set up a viewing platform, equipped with bird-watching landscape devices around, not only can glance at the industrial landscape features but also observe the daily life of birds such as egrets (Fig.3). In order to increase the flexibility of the moving line and reduce the pressure on the road, combining natural ecological elements and industrial elements, the retreating table covered steel frame is built to connect the mountain and the road, which is practical and adds landscape nodes.



Figure 3: Effect Picture of Viewing Platform

3.3.2. Creative Area: Functional Transformation, Creative Focus

The original site industrial buildings are basically warehouses or simple processing plants, the height is basically 1-3 layers, the facade form is monotonous, there is no exposed platform and opening space. The doors and Windows were partially damaged, and the internal frame structure of the building was relatively intact. Its transformation mode is mainly function replacement. The material structure of the original factory was adjusted, and the newly reconstructed space was transformed from the spatial attribute of the factory into a comprehensive place for office, museum, exhibition hall and public activity space combined with leisure and sports needs. The original memory of the factory was retained at the same time, and it became a compound scene with the continuous superposition of new Spaces. The main methods of transformation are mainly building renovation and building overall transformation. For the renovation of the building, the facade can be appropriately convex and convex and external to form an open balcony. Design a roof garden on the building, increase the outdoor building open space, and use modern new materials to transform it as an art exhibition hall. For the overall transformation of the building, the internal frame structure of the original building is retained, and the external facade of the wall is repackaged, and the material with industrial flavor can be used. The interior is used as Hangzhou Steel Museum, handicraft art museum, indoor sports field and so on[7].

3.3.3. Memory Area: New Use of Old Materials, Remembering Glory Again

In consideration of the original environment and route organization, combined with the current situation of the terrain, the design has post-industrial characteristics of the landscape. The old materials such as gantry crane, locomotive, steel and copper sheet are remade and rebuilt or used as new industrial pieces, which not only highlight the industrial atmosphere but also reflect the concept of sustainable circulation. The old track is repaired, and the tour route is planned, and the train transportation is re-used,

and the overall sightseeing style is given a smooth experience. Creative use of the existing site can be recycled brick and steel, while joining the popular science of Hangzhou Iron and Steel culture, taking into account the user experience, the production of industrial landscape interactive devices, with knowledge jigsaw, rotation, linking and other ways to mobilize people's experience in the abandoned land, improve the abandoned land landscape environment entertainment and appreciation of added value. The display of historical memory needs new forms and new techniques. The historical and cultural information of Hangzhou Iron and Steel is visually and statically displayed by the industrial history pavement of Hangzhou Iron and Steel, and the interactive landscape wall of Hangzhou Iron and Steel is equipped with the image box of old video, which can dynamically show the historical memory of Hangzhou Iron and Steel. At the same time, landscape lamp posts, porch frames and outdoor furniture are also integrated into post-industrial characteristics, shaping the identification of Hangzhou Iron and Steel Park and strengthening regional characteristics (Fig.4).



Figure 4: Effect of Time Memory Square

4. Conclusions

Through sorting out the types of industrial wasteland and sorting out the similarities and differences of the transformation modes of post-industrial landscape, this paper provides references for the shaping of the post-industrial landscape of Hangzhou Iron and Steel Co., and draws on the artistic conception of traditional classical gardens to create the landscape of Hangzhou Iron and Steel Plant ruins. While respecting the historical information of the original site, people's participation and experience are considered in the shaping of the landscape to meet people's needs for recreation, history and culture, and ecological nature, so as to achieve the harmony among the site, nature and people, with a view to helping the revitalization and regeneration of Hangzhou Iron and Steel Plant, and providing reference for the research on the landscape reconstruction of urban industrial wasteland.

References

- [1] Shuwei An. *The trend, harm, and governance of urban environmental pollution in China in recent years* [J]. *Urban Development Research*, 2013, 020 (005): 134-139.
- [2] Dai Daixin. *Post Industrial Landscape Design Language - Review of Landscape Design in the Core Area of Baoshan Energy Conservation and Environmental Protection Park in Shanghai* [J]. *Chinese Landscape Architecture*, 2011, 27 (8): 8-12.
- [3] Zhang Chao. *Research on Landscape Renewal of Urban Industrial Waste Land* [D]. Nanjing Forestry University, 2008.
- [4] Wei Ting. *The application of elastic design concept in post-industrial landscape design - Taking the landscape planning and design of the old factory area of Jinchangyu Gold Mine as an example* [D]. Xi'an Academy of Fine Arts, 2015.
- [5] Fang Lingbo, Jin Yunfeng. *A Study on the Regeneration Strategy of Brown Land Landscape in Europe: A Case Study of North Duisburg Park in Germany* [J]. *Residential Technology*, 2016, 36 (9): 27-32.
- [6] Ha Jing, Qu Wei. *Shenyang Industrial History and Current Situation of Industrial Building Relics* [J]. *Beijing Planning and Construction*, 2011 (01): 37-42.
- [7] Yang Lin, Wang Xiaofan. *The Combination of Creative Industry and Industrial Architectural Relics-Taking the 798 Area of Beijing as an Example* [J]. *Beijing Planning and Construction*, 2007 (02): 46-49.