

Research on Optimisation of Reconstruction Design based on Industrial Park: A Case Study of Beijing 798

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Abstract. With the rapid development of society, the reconstruction of industrial parks has become a focus of attention. This paper takes the Beijing 798 Art District as an example to introduce the development background of this historical industrial heritage area. Nowadays, the 798 Art District has many areas for improvement in the construction of public space, such as the demand for spatial convenience. It is mainly reflected in the parking regulation and space use problems caused by takeaway food delivery services. The takeaway workers often have to park their electric cars at the entrance of the park. Such behaviour seriously affects the facade and beauty of the park, but also brings inconvenience and security risks to tourists. Based on the analysis of the parking demand of 798 Art Park, this paper discusses and designs the special electric parking space of 798 Art Park. These parking Spaces are designed to integrate the unique industrial style of the 798 Art District to meet the public needs of the site and environment. Through the reconstruction and design optimization of special parking spots, the problem of disorderly parking by take-out workers is solved, and the overall image and visitor experience of the 798 Art District is improved. This research will further enrich the relevant methods and theories of the renovation of parking space in the old factory and provide a feasible reference and basis for the renovation of other parking areas in the old factory.

Keywords: 798 Art District, old industrial buildings, parking lot renovation.

1. Introduction

This study focuses on the entrance of the 798 Art District in Beijing and explores the problem of unreasonable space use caused by delivery drivers randomly parking electric vehicles in the non-parking area at the entrance. Delivery drivers often park their electric vehicles at the entrance to save time and complete orders quickly, causing inconvenience and chaos to the park management and the surrounding environment [1]. The aim of this study is to conduct in-depth research on the parking area of the 798 Art District and propose renovation plans to address this issue. This study has an important and positive impact on regulating the parking pattern at the entrance of an art park transformed from an industrial heritage and enhancing the visitors' experience. By planning a more rational parking area, one can optimize the parking behaviour of take-out workers at the entrance of the park, improve the overall environment and order of the park, as well as enhance the visitors' experience. The standardized parking pattern will make the park entrance more tidy and orderly, providing a comfortable and safe environment for visitors. By improving the visitors' playing experience, the visitors will be more willing to visit 798 Art Zone again.

This study mainly starts from the study of the industrial plants that have been deactivated in the urban development of Beijing and studies the problems existing in the planning of the entrance and exit parking area. The paper also discusses how to ensure a beautiful parking area and meet the parking needs of take-out workers while ensuring delivery time. The style and character of the industrial heritage are preserved through the renovation design and applied to the newly renovated parking area. By using the literature analysis method to find and read relevant materials and documents, this method has the advantage of being able to analyze the transformation and protection ideas of Beijing's industrial heritage very well. Checking how the completed transformation plan uses the style characteristics of the industrial park. Second, you can analyze the needs of take-out workers. In order to achieve the goal, carry out field analysis on the site road. Through the convenience of traffic conditions, choose the most suitable site. Investigate tourists and artists for research and ask

what can be improved during the process of recreation and use in the park. Carry out field investigation on the proposed parking area. By studying visitors' satisfaction with recreational activities in an industrial heritage park, one can guide subsequent design to focus on which issues should be paid attention to.

2. Literature Review

For the reconstruction of 798 Art Park, there are part of related literature which is representative, among which scholars Zhang Jingyu and Yin Zhiying studied the signage system design of Beijing 798 old industrial art zone in the article "Integral Research on Signage System Design of Beijing 798 Old Industrial Art Zone", and put forward that the signage system design of the old industrial art zone is not only simple to provide visitors with the function of guiding during the tour, but also to integrate the old industrial zone with its own style characteristics and cultural heritage, and at the same time reflect the design style characteristics of different regions. It is proposed that the signage system design of the old industrial art zone not only provide a simple function of guiding tourists when they visit the zone, but also integrates with the style characteristics and cultural heritage of the old industrial zone itself, and at the same time, reflect the style characteristics of the design of different regions. However, the design and construction as well as the implementation methods are less involved.

Scholar Dai Xianlu, in her article "Research on the Redesign of Industrial Heritage Buildings under the Background of Urban Renewal Strategy - Taking Beijing 798 Art Center as an Example", studied the process of urban renewal and development, the concept of industrial heritage and the development process of industrial heritage buildings' protection and reuse under urban renewal, and found the existing problems. This paper puts forward the problems that need attention and the rules that should be followed in the redesign and reconstruction of industrial heritage, including safety and economy, functional integrity, and regeneration design. However, the article does not mention how parking spaces should be handled [1].

In the article "Satisfaction Perception Analysis of Industrial Heritage Recreation Utilization", scholar Yu Wenting took Beijing 798 Art District as a case study to analyze the factors affecting the satisfaction of industrial heritage recreation space from the perspective of perception and verified the impact path. After that, the adjustment strategies and optimization suggestions for the development of recreational space in 798 and even the entire industrial heritage were proposed [2]. Problems were also discovered. The article pointed out that the respondents' most satisfied part of the park is the "attractiveness of tourism resources", and the renovation and renewal of 798 has provided unique tourism resources leisure services, and cultural and creative experiences for the surrounding areas. At the same time, it has promoted local economic growth and the improvement of urban quality and played a supporting role in the development of industrial tourism in Chaoyang District and even Beijing. It can be used to refer to the aspects that need to be noted in subsequent renovation activities.

Scholars Zhao Zhehua and Liu Yuchen in their article "On the Protection and Regeneration of Urban Industrial Cultural Heritage under the "Industrial Park Model" - Taking Beijing 798 Art Park as an Example", this article explore the connotation and protection mode of industrial heritage from the perspective of industrial heritage protection and regeneration. Taking Beijing 798 Art Park, one of the classic cases of industrial heritage protection in China, as an example, this article focuses on discussing the transformation design issues in the protection and utilization of urban industrial cultural heritage from the perspective of "industrial park model", and explores how to better protect and scientifically and reasonably utilize urban industrial cultural heritage through transformation and regeneration from the perspective of development and protection [3]. It was pointed out that the shortcomings in the 798 design indicate that the utilization of waste building materials in the old factory site is insufficient, and the utilization rate of materials such as bricks and stones is insufficient, resulting in certain waste and being environmentally unfriendly. Secondly, the original environment inside has not been well preserved, and some of the vegetation inside the park has been damaged.

3. Background

The Beijing 798 factory was built before the 1950s as part of the GDR's aid program to China. It is located in the Dashanzi area in the northeastern suburbs of Beijing. It consists of six original industrial factories, of which the 798 Factory covers the largest area, so the area where these factories are located is collectively known as 798 [4]. The 798 Art District covers a total area of more than 600,000 square meters and was initially planned and constructed by experts from the GDR. The project was designed by an architectural firm in Dessau, which was located in the same city as the Bauhaus and thus displayed the characteristics of German Bauhaus design. The buildings in the factory area were a perfect combination of practicality and simplicity, a feature that suited the needs of China at the time [5].

In the 1990s, under the wave of Beijing's urban development, the urban structure was adjusted. Some enterprises have a situation where the sales are not right. Some enterprises chose to rent out the factory to save costs and tide over the sad 798 factories that inevitably stopped production and left behind the industrial park. From 1995 to 2001, professors from the sculpture department of the Central Academy of Fine Arts rented the abandoned workshop of the 798 factory and used it to create large-scale sculptures [6]. It was from this time that the old 798 factory district began to transform into an art district. Its industrial elements fit the needs of artistic creation, coupled with its low rent and superior geographical location near the Central Academy of Fine Arts. 798 Art District can develop and grow in just a few years. A large number of artists were attracted by it and chose to enter the 798 Art Zone for artistic creation. Since then, the 798 Art District has developed rapidly [7].

With the development of the times, 798's business scale, business form, consumer demand and other aspects have undergone turning changes. The year 2007 has become an important point in the transformation of the 798 Art District, and years of artistic development have made the business in the park more and more mature. The opening of the Beijing Olympic Games in 2008 gave the 798 Art District show a geographical advantage, and received a lot of attention and visits from Chinese and foreign tourists, followed by an increase in its rent year by year [8]. The environment was no longer suitable for artistic creation, and the artist's studio began to gradually dwindle and transform into art display and art trading.

Since 2013, the number of companies and enterprises has sharply decreased, and the main business models have transformed into catering, commerce, and cultural and creative industries with direct economic benefits and mainly serving tourists. The main business revenue within the park is also mainly related to art-related businesses. The departure of artists has led to the weakening of corresponding art institutions and characteristics and has resulted in an imbalance between art and commerce.

4. Existing Problem

Due to the high price of food and beverages in the park, the staff and artists inside the 798 Park prefer to solve the dining problem by taking out food. Takeaway electric vehicles can not enter the park, there will be a large number of electric vehicles piled up at the door. The phenomenon of disorderly parking of take-away electric bicycles is more prominent. Some takeout riders choose to park electric bicycles on the sidewalk to save time, occupying the space for pedestrians to walk, and resulting in crowded pedestrian traffic on the sidewalk. Due to the parking of electric bicycles on the narrow sidewalk, the pedestrian walking space is compressed, and sometimes they have to borrow motor vehicle lanes to walk, increasing the traffic safety risk of pedestrians [9]. There will be a large number of take-out orders in the noon or afternoon meal rush, and electric vehicles parked randomly at the entrance of the park will hurt the aesthetics and traffic at the entrance of the park.

Secondly, the planning of parking and drop-off areas is not convenient enough, especially at the entrance of the park. The park's lanes are relatively narrow, making it easy to cause congestion during high passenger traffic. Tourists who choose to take a taxi to the park are more susceptible to being affected, often encountering traffic congestion near the entrance. To save time, sometimes tourists

have to get off and walk closer to the entrance to their destination. In addition, the travel experience of tourists is also affected to a certain extent. The parking fees inside the park are relatively high, and some art workers are unwilling to bear the high parking costs when driving to work. They also choose to park their vehicles on the roadside and hike tens of thousands of work sites [10].

5. Optimization Solutions

5.1. Dedicated Parking Plan

Plan new electric vehicle parking spaces and more convenient motor vehicle parking areas near the entrance for food delivery workers, and install food delivery storage cabinets to improve the problem of having to park randomly to save time. Reasonable allocation of parking resources can be achieved through shared parking. Firstly, determine the parking rate of the surrounding parking lots and display the number of vehicles accommodated during the peak period of the survey day [11]. Secondly, analyze the demand and influencing factors for motor vehicle parking spaces, understand which period of the day has the highest parking demand, and thus determine the number of peak parking spaces. Based on the analysis of people's travel preferences, it is found that people sometimes choose carpooling, and there is a wide variety of transportation options available. More and more tourists are choosing carpooling, bike sharing, and other modes of transportation, which may reduce the demand for parking. Parking space planning should be based on people's preferred modes of transportation.

5.2. Combine Cultural Characteristics

After planning the parking lot, the park can be combined with the industrial cultural characteristics of Beijing 798 to carry out a stylistic design. Because its cultural core contains historical value, it has witnessed the development process of the city, witnessed the rise and fall of 798, and played the function of transmitting historical information, which is an important legacy left over from the urban development. By continuing its style characteristics into a new building or parking space, it can feel the sense of ritual and weight of history through the continuation of the style. The preservation of industrial heritage buildings has a positive role in promoting the diversified development of local cultural connotations and provides valuable research and practice materials for social research on the direction of industrial heritage protection and industrial heritage reuse [12]. Historical relic buildings need to be preserved as much as possible to continue and protect the original historical significance and value, and the new area should be guided by this, and carry out a distinctive style design while showing the authenticity and integrity of The Times.

5.3. Material Optimization

The recycling of materials needs to be considered in the planning and design of parking spaces. Since industrial heritage buildings have different scientific and technological values from cultural heritage buildings, the important technologies and material structures carried inside them can still be studied and utilized. The architectural structure, materials, and construction methods are the architectural direction of a specific period in history, with uniqueness and advancement, which is very valuable for modern society [12].

Some unique visual art elements of factory buildings in 798 can be used in the construction of parking areas. For example, a large number of iron products, and a large number of iron pipes crisscross the park. Rugged and tough, the appearance of a cold shape with the appearance of rust texture over the years to form a natural high-tech style. The factory facade and almost all red brick walls are built, its cold and old texture exudes a strong modern style. It can produce a strong visual contrast with other structures of the building, and can better compare the virtual and real.

5.4. Functional Design

Simultaneously adding some functional elements to enhance the convenience and practicality of parking spaces. When designing parking spaces, one can break through conventional design thinking and approach new types of parking space design with a developmental perspective. Predict the trend and changes in the future increment of parking space, and leave blank space in the designed space. Simultaneously adopting new means and technologies to enhance the plasticity of space.

The 798 site road is more of a mixed state, and the boundaries of the parking space are unclear. This characteristic gives a favorable condition for the planning and design of the new parking space. In the era of new energy vehicles, the charging pile equipment of electric vehicles and the charging pile equipment of electric bicycles can be combined with the charging needs of electric vehicles, so as to realize the functional diversification of parking and charging facilities [12]. By adapting to the characteristics of the transportation of the times, the economic benefits and profits of parking facility resources can be maximized [11].

6. Conclusion

Focusing on the development context of Beijing's 798 Industrial Art District, this study analyzes in depth the impact of the takeout-dominated dining environment on the parking pressure at the entrance of the 798 Art District, as well as the negative environmental impacts brought about by the takeout-intensive model. This paper combines the current problems and the mixed use of the roads near 798 and proposes the solution of parking space planning and construction at the appropriate site. At the same time, it discusses several key points that need to be paid special attention to when designing the parking space. To solve the problem of chaotic parking near the entrance of 798 Art District, the planning of exclusive parking spaces is carried out. This includes planning new parking spaces for electric vehicles and more convenient parking areas for motor vehicles, as well as lockers for takeaways. It should be combined with its historical and cultural characteristics to carry out stylized design. Continuation of the exterior features of the 798 industrial building, such as the iron facade and red brick walls. In the planning, design, and construction of subsequent parking spaces, the recycling and sustainable development of materials should be considered. Try to use the building materials and processes that are unique to the park, such as trusses and discarded I-beams. Finally, parking lots should also be designed with functionality in mind. While meeting parking needs, incorporating cutting-edge functional facilities such as charging stations can enhance the overall quality and user experience of the parking lot. This study provides valuable reference significance for the future renovation of parking spaces in industrial areas, mainly affecting the planning and design direction of parking lots. Future research should focus more on the protection of industrial heritage buildings themselves and the integration of cutting-edge technologies of the times.

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