

# Protection of Industrial Heritage in the Context of Urban Renewal

Deqing Bu<sup>1,a</sup>, Yuqin Wu<sup>1,b</sup>

<sup>1</sup>*School of Architecture and Art, North China University of Technology, Beijing, China*  
<sup>a</sup>790397535@qq.com, <sup>b</sup>1772918071@qq.com

**Abstract:** *In the context of urbanization, the original land use nature is gradually replaced, and industrial heritage is an indispensable part of the city, carrying the development memory of the city and the significance of cultural punctuation. Therefore, how to reuse these idle or abandoned industrial land is a problem that urban development must face. With the acceleration of urbanization, the protection and reuse of industrial heritage has become an important issue in urban renewal. Taking Beijing Shougang Park as an example, this paper discusses the necessity, strategy and realization path of industrial heritage protection in the context of urban renewal. Through the in-depth study of the historical background, current situation analysis and protection strategy of Shougang Park, the effective ways of adaptive reuse are summarized, in order to provide reference for the protection of industrial heritage in other cities.*

**Keywords:** *Urban Renewal; Industrial Heritage; Beijing Shougang Park; Protection and Utilization*

## 1. Introduction

As significant cultural heritage and tourism resources, industrial heritage is receiving increasing public attention alongside social development. With the advancement of urbanization and adjustments to traditional industrial structures, many large-scale traditional industrial zones have gradually become obsolete, leading to a significant amount of industrial land being left idle or abandoned, which hinders urban development. Industrial heritage not only records the glory of industrial development but also carries rich cultural connotations, serving as an important part of urban history. As industrial restructuring and urbanization progress, a substantial amount of industrial heritage faces the risk of abandonment or demolition. Most industrial heritage sites are located in core urban areas, and as integral parts of the city, the protection and reuse of industrial heritage have become a crucial issue in urban renewal—a topic that is gaining momentum in the process of urbanization. Industrial heritage holds significant historical, cultural, artistic, and social value. Its preservation and adaptive reuse can not only inject new impetus into urban renewal but also promote sustainable urban development.<sup>[1]</sup>

## 2. Related Concepts and Research Background

### 2.1 The Concept of Urban Renewal

Urban renewal refers to the process of implementing comprehensive transformation and upgrading of areas within a city that are characterized by obsolescence, overcrowding, or functional deficiencies. This concept encompasses many aspects, including urban planning, land reuse, infrastructure renewal, and residential development. Urban renewal typically involves several key areas, primarily concerning infrastructure updates and improvements. This includes the modernization and expansion of infrastructure such as roads, bridges, drainage systems, and public transportation to support population growth and economic activity.

**Renovation of Old Districts and Land Reuse:** Through the demolition of old buildings or the renovation of existing structures, land resources are repurposed for the re-planning and construction of modern residential, commercial, and public facilities. This promotes the enhancement of the area's overall functionality and quality of living.

**Community Development and Resident Participation:** Emphasis is placed on the participation of community residents and the protection of their interests. Through measures such as community

consultation, provision of appropriate compensation, and relocation(resettlement), the interests of residents are safeguarded while promoting social harmony within the community.

**Environmental Protection and Sustainable Development:** In the process of urban renewal, measures focused on energy conservation, emissions reduction, improved resource efficiency, green building, and urban greening are implemented. This achieves a win-win situation for both urban renewal and environmental protection.

**Economic Vitality and Enhanced Urban Image:** Through investment attraction, urban renewal aims to boost regional economic vitality and competitiveness. It also seeks to enhance the city's image and attractiveness, thereby promoting sustainable urban development. Therefore, urban renewal is not merely a simple construction project but a comprehensive strategy for urban management and development. It should be advanced towards the goals of becoming more livable, sustainable, and competitive, with the aim of enhancing the city's overall functionality and the quality of life for its residents.

However, since the reform and opening-up, China has experienced a rapid urbanization process with a sharp increase in urban population and urban area. As cities expanded swiftly, many urban infrastructures and buildings could no longer meet the demands of modern life and development. The government has introduced multiple policies and initiatives to support and promote urban renewal at the national level. [2]Documents such as the "State Council's Guidelines on Advancing the Construction of Urban Underground Utility Tunnels" and the "Guidelines on Further Promoting the Development of Urban Parking Lots" have clearly outlined the goals and directions of urban renewal, with the construction of urban underground utility tunnels (hereinafter referred to as "underground utility tunnels") becoming a key focus. Among these efforts, initiatives include the protection and reuse of industrial heritage, the revitalization of abandoned or idle industrial sites, the development of emerging industries such as cultural and creative industries and tourism, as well as the injection of new vitality into old industrial zones.

## ***2.2 Urban Renewal Concept***

Industrial heritage embodies significant historical, cultural, artistic, technological, and social value, comprising multiple industrial buildings, mechanical equipment, workshops, storage spaces, and other structures. [3]Protecting industrial heritage means safeguarding and effectively utilizing these sites rich in multifaceted value. By rationally planning their spatial environment, renewing their architectural facilities, and deeply exploring their cultural connotations, we can highlight their uniqueness, revitalize industrial heritage, and sustain its legacy. However, in the current urbanization process, many industrial heritage sites face the risk of demolition due to industrial shutdowns, land-use conversions, and excessive real estate development. Industrial heritage is not only a precious asset of cities, but its preservation is crucial not only for the heritage itself but also holds profound significance for urban development.

## ***2.3 Current Status of Research on Industrial Heritage Protection at Home and Abroad***

The research and practice in urban renewal and industrial heritage protection abroad not only cover theoretical discussions, but also include specific policy measures and implementation cases. In many developed countries, detailed urban renewal policies and laws and regulations are formulated to support and guide the sustainable development of cities. For example, the urban renewal policy in the United States emphasizes community participation and public investment, encouraging private sector participation in the reconstruction of old areas through tax incentives and subsidies. The UK promotes the modernization of urban infrastructure and community facilities by establishing urban renewal institutions and funds, enhancing the overall living and commercial environment of cities. [4] In terms of protecting industrial heritage, foreign countries have adopted many strategies to protect and reuse industrial heritage. For example, Germany has collaborated with federal and local governments to transform abandoned industrial buildings into cultural and creative industry centers, preserving the historical value of industrial heritage while promoting economic revitalization and cultural innovation. [5]France, on the other hand, has established specialized industrial heritage protection policies through its national heritage protection agency to safeguard the appearance and structure of industrial buildings, while encouraging private and non-profit organizations to participate in their reuse projects. In addition, foreign countries also focus on sharing best practices in urban renewal and industrial heritage protection through international cooperation and exchange. For example, UNESCO promotes the

protection and inheritance of global industrial heritage through World Heritage conservation projects, and facilitates cross-border cultural exchange and cooperation.

From a domestic perspective, the protection and reuse of industrial heritage are gradually receiving widespread attention and importance. However, compared with developed countries, there are still some challenges and difficulties that need to be solved in the protection of industrial heritage in China. One is that many old industrial areas are facing the pressure of rapid economic development and accelerated urbanization for elimination and reconstruction. In the case of limited land resources, there are often contradictions and conflicts between the protection of industrial heritage and urban renewal, and some historical buildings and cultural heritage may face the risk of demolition due to economic interests. Secondly, the current legal and regulatory system for the protection of industrial heritage in China is not yet sound, lacking comprehensive policy measures specifically aimed at the protection and reuse of industrial heritage. [6] Although laws, regulations, and policies related to the protection of cultural heritage are gradually improving, there is still a need to further deepen policy research and formulation for the special and complex nature of industrial heritage, in order to effectively protect and rationally utilize industrial heritage resources. So the protection of industrial heritage in China faces many challenges and opportunities.

### **3. Development Background of Shougang**

#### ***3.1 Development History of Shougang***

The Beijing Shougang Park, located in the main factory area of Shougang on the Yongding River in the west of Beijing, was first built in 1919. Beijing Iron and Steel Corporation, established in 1958, is one of the important representatives of China's steel industry. Beijing Shougang, as a large-scale steel enterprise supported by the state, bears the heavy responsibility of steel production during the national planned economy period and has made significant contributions to the industrialization development of Beijing and surrounding areas. [7] The current types of Shougang remains are the largest and most well preserved steel industry sites in China, including buildings, transportation routes, and vehicles (see *Figure 1*). The development of Shougang has gone through the humiliation and hardships of the era of aggressive wars, the growing national entrepreneurship in New China, the technological advancement and development boom after the reform and opening up, and the development process of Shougang around the 1994 question of "whether we want Beijing or Shougang". The development process of Shougang can be described as going through hardships and hardships? The government, experts, the public, and the people of Shougang engaged in a series of intense discussions, and the shutdown and relocation dramatically accelerated Beijing's successful bid for the 2001 Olympics. After the shutdown began in 2005, Shougang actively promoted various types of transformation explorations (such as resource surveys, pilot projects for international competition launch zones, and experimental renovations), but due to the complex problems encountered in the transformation of this super large state-owned enterprise's self use land, most planning schemes could only stay at the level of drawings and texts. In 2014, the national level promoted the transformation and upgrading of old industrial areas in urban areas. Shougang took the opportunity to include the West Ten Silos in the transformation plan. After its completion and landing in 2015, it was selected as the headquarters of the 2022 Beijing Winter Olympics Organizing Committee due to its ecological positioning from "brown" to "green". Later, it became the office and important event venue of the 2022 Beijing Winter Olympics Organizing Committee, becoming a new landmark in Beijing. Shougang also ushered in a new opportunity for planning transformation and functional transformation. Beijing Shougang's transformation of different functions in a short period of time not only has real-time economic benefits, but also serves as a landmark symbol of national development. [8]



*Figure 1 Front Appearance of Shougang (Source Network).*

### **3.2 Development Status of Shougang**

Shougang's original factory was located in the southwest region of Beijing, which was previously a nationally renowned steel enterprise with a considerable reputation in the local area. With the needs of Beijing's urban development and the hosting of the Olympic Games, Beijing Shougang has carried out industrial restructuring and urban renewal projects. The original steel production facilities were gradually relocated, and some factory areas were transformed into modern cultural and creative industry parks and public cultural facilities, forming the "Shougang Park". The current Shougang Industrial Park in Beijing has become a multifunctional area that integrates culture, art, creativity, technology, and tourism. The park has preserved a large number of industrial heritage sites with historical value, such as steel production workshops and industrial facilities. Through the introduction and operation of cultural and creative industries, it has reshaped the new life and vitality of the original industrial zone.

## **4. Design Concepts and Methods for the Protection of Shougang Industrial Heritage**

### **4.1 Shougang Industrial Heritage Protection Concept**

In the renovation of Shougang Park, the main focus is on five points: historical memory and cultural inheritance, functional transformation and sustainable development, combination of protection and innovation, citizen participation and community sharing, ecological environment and sustainable development. The protection of Beijing Shougang's industrial heritage is not only a way to inherit and promote its rich industrial historical and cultural value. Showcasing the development trajectory of the industrial era, reflecting the fighting spirit of the working class and the achievements of modern industrial civilization, by preserving and restoring existing industrial buildings, facilities, and relics. In the process of protecting industrial heritage, the transformation of Shougang Park also pays attention to the combination of protection and innovation. While protecting and innovating, Shougang Park not only maintains its original style in terms of building appearance, but also updates its modern facilities and functions internally while ensuring the safety and sustainability of building use. At the same time, while protecting industrial heritage, the original steel plant will be transformed into a multifunctional area for cultural and creative industries, art centers, and technological innovation bases. By attracting the entry and development of cultural and creative industries, the transformation and reuse of Shougang Park's functions will be achieved, and the regional economy will be transformed and upgraded, achieving a win-win situation for economic and social benefits. The transformation of Shougang Park strengthens the sense of identity and participation of community residents and the general public in the

protection of industrial heritage, and forms social consensus and support through public education activities, cultural and artistic events, and other forms. The transformation of Shougang Park is also focused on protecting the ecological environment and achieving sustainable development. It reduces the impact on the environment by organically combining urban renewal and ecological protection through measures such as greening, energy conservation, and emission reduction.

## **4.2 Shougang Industrial Heritage Renovation and Protection Case Shougang North District**

### **4.2.1 Overall planning**

The planning scope is based on the spatial structure of "three belts and five zones" to layout the northern area, with a total land area of 291 hectares and a building scale of 1.82 million square meters. The plan adopts a mixed development model to create diverse residential patterns and diverse urban activities that create an inclusive neighborhood environment. To provide various places for social interaction, leisure and entertainment, cultural and sports activities for technological innovators who promote the healthy development of the park's functions, the urban design should reasonably allocate rich and colorful supporting facilities. The plan is based on the concept of "integrating multiple regulations", drawing a blueprint that highlights innovation, repair, vitality, greenness, and wisdom, adhering to the low impact development model of "preserving characteristics", "green ecology", and "reducing quantity and improving quality", and constructing a new urban form that is people-oriented, harmonious, and livable. The final planning will form a functional structure of "three belts and five zones", which includes the waterfront comprehensive leisure belt, urban public activity leisure belt, and the green ecological belt of the West Chang'an Avenue extension line; The five major areas are the Winter Olympics Square area, the Shougang Industrial Site Park area, the Shijingshan Cultural Landscape area, the Urban Weaving Innovation Factory, and the Public Service Supporting Area (the core area of Shougang International Talent Community), (see *Figure 2*) which are five functional areas with their own characteristics and cooperate with each other.



*Figure 2 Land Use Function Planning Map of Shougang North District (Source Network).*

### **4.2.2 Cultural Protection and Utilization**

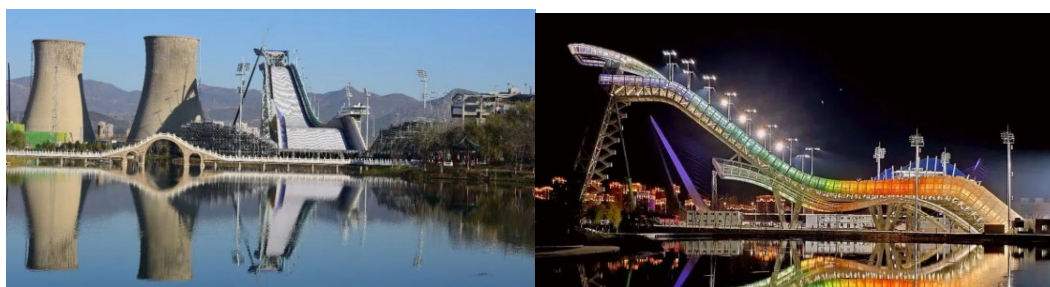
The Shougang North District renovation project, which introduced a quantitative assessment system for architectural style in its planning, has proposed for the first time a "building appearance" assessment system, which includes "ordinary appearance", "brown appearance", "green appearance", etc., and can conduct specific quantitative assessments on them. This evaluation system has been applied for the first time in the New Shougang area. The project adopts the concept of "weaving and repairing the city", focusing on preserving the urban style, achieving effective control of spatial dimensionality, plane coordination, and overall style. This provides a scientific strategy and method for analyzing, evaluating, and reusing the landscape of industrial brownfields, effectively guiding the overall landscape and spatial quality of industrial heritage. At the same time, the three elements of guidance are adopted when renovating the architectural style of the area. The Shougang North District renovation project divides it into traditional architectural style area, ethnic form factory area, and factory style area guidelines. While preserving the original architectural style, a spatial stronghold has been formed. For larger scale factories, new buildings with larger spaces have been added through techniques such as filling negative shapes to provide space for multifunctional displays, offices, and other functions. The existing resources such as the aerial walkway are fully utilized in the spatial transformation: the existing industrial heritage resources are transformed and fully utilized, emphasizing green transformation and ecological design concepts, and the overall connection of Shougang North District is used as an aerial three-dimensional straight corridor. The first phase of the



construction of the multi-level lake view West Ten Winter Olympics Square on the north side of Qunming Lake, and the renovation of the existing corridor (see Figure 3). By using techniques such as "patching," "linking," and "sewing," the spatial scale relationships of the structure are reorganized and modified while preserving the original structure. <sup>[9]</sup>Preserve the unique features of this region, such as regional environment, cultural style, and architectural style. (See Figure 4). Ski Jumping Platform: A large ski jumping platform with a strong industrial color, set against the backdrop of a cooling tower and supported by industrial relics. The design is based on the Dunhuang mural image of "Flying Apsaras", with the curves of the single board large jumping platform itself that highlight a sense of elegance and harmony (see Figure 5). At the same time, comprehensive maintenance and restoration of existing natural resources have been carried out, such as ecological restoration of Qunming Lake, design of four level revetments, spatial layout of lake shores, and greening of vegetation. The renovation highlights its water ecological governance and restoration, strengthens the design of flexible interfaces, hydrophilic revetments, etc., and inherits the vegetation characteristics of the park. As one of the few mountain ranges and a large area of green space within Shougang Park, Shijingshan Landscape Park has a unique style in both the lush mountains and the palace landscape. As one of the few mountain ranges and a large area of green space within Shougang Park, Shijingshan Landscape Park has a unique style in both the lush mountains and the palace landscape. The renovation of it focuses on the renewal and reuse of existing buildings and industrial relics, forming an organic coexistence of historical relics and newly-built landscapes.



*Figure 3: Comparison of the First Steel Garden - Skywalk Renovation Before and After (Source Network).*



*Figure 4 and Figure 5: Comparison of the First Steel Garden before and after the renovation of the West Tenth Winter Olympics Square (source network).*

#### **4.2.3 Summary**

The renovation of Shougang North District is a good practical implementation case for China's

industrial protection and development. Its advantage lies in achieving the protection and inheritance of historical and cultural heritage: Shougang North District has preserved a large number of historical buildings and cultural heritage during the renovation process by introducing a quantitative evaluation system for architectural style and the concept of "weaving the city", successfully promoting the unique charm of industrial culture.<sup>[10]</sup> 2. Diversification and Innovation of Functions: The park has introduced various functions such as cultural creativity and technological innovation, which has promoted the diversified development of the region and greatly enhanced the vitality and innovation of the park. 3. Ecological Environment Protection and Sustainability: The project focuses on ecological environment protection, and through measures such as greening, energy conservation, and emission reduction, implements a low impact development model, successfully building a livable green ecological environment. 4. Public participation and community sharing: Rich supporting facilities and public activity venues enhance social interaction and

Cultural life effectively enhances public participation and sense of belonging. But it also has certain drawbacks. Due to high investment and maintenance costs, difficulty in integrating functions, large scale of protection and renovation projects, traffic pressure, and insufficient supporting facilities, the renovation process requires a significant amount of capital investment and continuous maintenance, which poses certain challenges to the long-term sustainable development of the project. And while achieving functional diversification, how to effectively integrate the usage requirements and spatial layout of different functional areas, avoid resource waste and functional overlap, is a complex problem that needs to be solved. With the development of the park and the increase in foot traffic, further planning and solutions are still needed to alleviate traffic pressure and improve supporting facilities to ensure the efficient operation of the park and the quality of life of residents.

## 5. Conclusion

The practice of protecting heritage in Beijing Shougang Park is not only to protect and restore industrial relics, but also to inherit and recreate the cultural history of the city. The cultural value of Shougang, as an important heritage of modern Chinese industry, is irreplaceable. Shougang not only witnessed the glorious history of China's industrialization process, but also an important symbol of the country's development of Shougang's industrialization, and an important symbol of China's national industry. Its historical buildings and facilities carry the memories and emotions of several generations, not only symbolizing industrial culture. The protection and reuse of Shougang not only preserves the historical memory of the city, but also allows the city to continue its historical development, adding dimensions of modern urban life in culture and emotion. For the Shougang Industrial Park, which has successfully achieved the integration of history and modernity, culture and industry, it has become a model for urban heritage protection through the protection and reuse of industrial heritage. This article summarizes the successful experience of Shougang Garden Heritage Protection, providing useful references and guidance for the protection and utilization of industrial heritage in other cities.

## References

- [1] Cao Z. *Latest data on Beijing urban renewal released*[N]. *Beijing Sub-Center News*, 2024-05-29(001).
- [2] Huang Z W. *Enlightenment of Xi Jinping Thought on Ecological Civilization to urban renewal: A case study of the "micro-renovation" of Guangzhou Wing Airport Cultural Tourism Town*[J]. *Modern Business Trade Industry*, 2024, 45(12): 4-6. DOI:10.19311/j.cnki.1672-3198.2024.12.002.
- [3] Qiao Z, Qi D Y, Cheng Y J. *Protection and reuse of industrial heritage under the background of urban renewal* [J]. *Modern Horticulture*, 2024, 47 (11). DOI:10.12345/j.cnki.moderhort.2024.11.013.
- [4] Chen J Z, Zhu R. *Cultural expression in industrial heritage renewal: Reflections on British industrial heritage*[J]. *Southeast Culture*, 2024, (02): 184-190.
- [5] Liu B Y. *Review on the development of industrial building heritage protection*[J]. *Architectural Journal*, 2012, (01): 12-17.
- [6] Li Z Y. *Making cultural heritage "live" better in the present*[N]. *Economic Information Daily*, 2024-02-26(006). DOI:10.28419/n.cnki.njck.2024.000682.
- [7] Sun M Y. *Observing the protection and reuse of industrial heritage from the "rebirth" of Shougang Blast Furnace No.3*[N]. *Heilongjiang Daily*, 2024-06-12(002).
- [8] Zhang F M, Xu M. *Development of green and low-carbon ironmaking technology in Shougang*[J]. *Ironmaking*, 2022, 41(06): 16-25.

[9] Shougang Old Industrial Zone Renovation: West Tenth Winter Olympics Plaza Project[J]. *Architectural Practice*, 2019, (12): 177.

[10] Cui N. Urban spatial landscape design strategies based on industrial heritage protection[J]. *Footwear Technology and Design*, 2024, 4(06): 173-175.