

Research on Landscape Art Design of Industrial Brownfield Regeneration

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Abstract: *With the gradual fading of the global industrial economic era, a large number of products of the industrial era have appeared. People are already in the invisible pollution of brownfields. The emergence of brownfields has brought a series of thorny issues related to the environment and society. This article expounds the concept and classification of brownfields. Guided by the concept of ecological restoration and landscape regeneration, it analyzes and researches the sense of brownfield landscape design from the aspects of ecological environment, social and cultural, economic value, and aesthetic value. The whole process of guiding the landscape design in industry has a clear direction to promote the optimization and perfection of the environment in my country's urban industry.*

Keywords: *Industrial brownfield, Landscape, Regeneration, Design*

1. Introduction

Due to the rapid development of urbanization, the adjustment of urban structure, and poor urban planning and management, a large number of brownfields appear. Brownfields hinder the sustainable development of cities. How to use brownfields more sustainably has become a real problem to be solved. Idle and unreasonable development and utilization of brownfields in the process of urbanization have led to disordered urban landscapes, lack of cultural heritage, and lack of public attributes of the landscape, which seriously affects the healthy and sustainable development of the city [1]. Especially in the context of the rapid increase in the number of urban residents, it is difficult for new urban residents who have transformed from rural areas to urban residents to find their sense of belonging to the city. In this context, this article puts forward the perspective and method of landscape regeneration design to explore the possibility of solving its problems [2]. The restoration of brownfields not only has its theoretical research significance, but its huge market value also has greater practical and practical value. This article carries out brownfield restoration and landscape regeneration from the perspective of landscape design, exploring the possibility, forward-looking and exemplary nature of its brownfield landscape regeneration design, studying the past, looking forward to the future, and enabling it to solve the practical problems in urbanization development [3].

2. Brownfield Concept and Classification

2.1 The Concept of Brownfield

In the process of human development of industry and productivity, a series of problems have arisen, especially the impact on the ecological environment. Ignoring the protection of the ecological environment during the development process has led to continuous destruction of the ecological environment. The once-green earth gradually loses its color [4]. The soil, water, and air on which all lives depend are gradually polluted, and they are beginning to endanger the health and safety of human beings [5]. As a result, more and more people pay attention to the ecological environment. Research on ecological protection issues in various fields is gradually being carried out. How to repair the damaged ecological balance, scholars and experts from various countries have launched a series of investigations and studies, facing a desolate land, how to restore it to green, so there is the concept of brownfield [6]. The concept of brownfield first appeared in the British literature on green space planning. The original definition was "abandoned and underutilized industrial land, or known or suspected contaminated land". From then on, western countries began to pay attention to the issue of brownfields, and began to study the management of brownfields, and carried out a series of theoretical explorations and practices on the

protection and utilization of brownfields [7].

2.2 Classification of Brownfields

Brownfields exist on the land of various countries in the world. According to different sources of pollution, brownfields can be divided into physical, biological and chemical brownfields. According to different transformation purposes, it can be divided into industrial brownfields, public brownfields, commercial brownfields, and residential brownfields. According to the different degree of pollution, it can be divided into light, moderate and severe pollution. Different types of brownfields should be treated according to their characteristics in order to better restore brownfields.

From the perspective of the reasons, brownfields can be divided into three different types: The first category is the sites left over due to changes in the industrial structure during urban development. The second category is the raw material production institutions distributed in the outer periphery of the city. Due to the influence of industry development, their functions are gradually degraded and the land is abandoned. From the perspective of industry type: brownfield land can be roughly divided into industrial and commercial land, municipal land and other land. From the perspective of land use function, brownfields can be roughly divided into the following two categories [8]. The first category is ecologically destructive brownfields, which include terrain collapse due to excessive industrial mining, unreasonable use of natural resources, and water pollution during industrial production. The regional ecological imbalance caused by geological disasters has caused serious land damage. The second category is industrial abandoned brownfields, including a large number of buildings, factories, and industrial facilities built by urban industrial development. Due to the reorganization of the industrial structure, the areas that had to be abandoned, the industrial facilities occupy a huge area and are difficult to demolish and rebuild, and they will eventually become brownfields.

3. Principles of Landscape Art Design for Industrial Brownfield Regeneration

3.1 Adapt to Local Conditions

Industrial brownfields are located in urban areas, and the surrounding areas are mostly residential areas and schools. Therefore, the functional requirements for the design of the site will increase, and we need to consider its characteristic environmental space. Due to the cultural nature of the site itself, it should be combined with the needs of the surrounding people to create a healthy and humanized natural environment to truly adapt to local conditions.

The natural environment is the environment that people rely on for survival. In the natural environment, there are a lot of green vegetation. Green plants can weaken the surrounding sound waves, allowing people to breathe freely, and it can suck away dust in the air and block some industrial waste gas. It can kill pathogens similar to tuberculosis and help control the incidence of diseases; the oxygen released by green vegetation after photosynthesis provides protection for people's physical health. It can relieve people's mental health and adjust people's mental health. Moreover, there are a large number of flowers in the natural environment. A large number of greenery and the embellishment of flowers of various colors can relieve the psychological pressure of people who come to visit the garden, relieve people's negative emotions and cultivate sentiment. The local climate should also be considered according to local conditions. In the planting of plants, attention should be paid to the seasonality of plants and the deployment of colors, so as to adjust the time of people's activities in the outdoor environment and enable them to spend a long time outdoors.

3.2 People Oriented

For people's travel, the factor that can have the greatest impact on their travel behavior is whether the travel traffic is convenient. Comfortable and convenient transportation routes and diversified travel modes can make people exercise virtually. Studies have shown that the body's resistance to diseases will continue to improve with fixed exercises. In addition to walking, cycling and jogging can make the individual's physical and mental development better. While satisfying health and safety, these modes of transportation should bring more comfort and convenience to people.

Create a healthy transportation network. The slow route is the most basic component path of the transportation network, which plays a role in the entire site. The transportation network can be divided into transportation type and leisure type. The transportation type transportation network refers to the

route that meets people's ability to reach the destination quickly. The latter refers to the integration of some entertainment functions under the premise of satisfying the basic walking function. And the route of leisure function enables people to relax their minds and bodies while walking. The former is characterized by being able to reach the destination directly and quickly, while the latter allows physical exercise and spiritual relaxation during walking. Therefore, we can set up more landscape nodes in the traffic route to attract people to spend more time outside.

Set healthy road nodes. The intersection of the pedestrian lane and the vehicle lane is called a road node. Setting a healthy and comfortable environment here can not only ensure people's safety, but also make the entire road experience higher. The setting of healthy road nodes not only It is necessary to ensure that people will not be exposed to danger from motor vehicles when they are walking, and barrier-free designs should be set up for special groups to enable them to have a better road experience.

3.3 Principle of Harmony and Symbiosis

As an important part of the city, brownfields should conform to the overall urban landscape planning, and the design style should coexist harmoniously with the overall style of the city and be integrated into the city's picture. The principle of harmonious coexistence is specifically expressed in the design of brownfield landscape: 1. The harmonious symbiosis of the natural ecological landscape and the artificially reproduced landscape; 2. The harmonious symbiosis between the reserved architectural style and the newly-added architectural style of the site; 3. Historical culture and modern thought Harmonious symbiosis of the site; Fourth, the harmonious symbiosis of plant collocation and site buildings and site natural conditions; The brownfield landscape design based on the principle of harmonious symbiosis is realized under the comprehensive site condition analysis and the overall evaluation of the site's history, culture and economic level. Through the analysis and investigation of the urban development process to understand the urban cultural context, and then determine the overall urban design style and planning thinking style, on this basis, how to organically integrate the landscape elements, plants, soil, and water bodies with the existing conditions of the site, and more Good promotion of site management and planning; the original buildings of the site are the bearing of historical development, recording the changes of the city and the rise and fall of industry. If they are completely demolished or left intact, they will destroy the overall harmony, only combining the functional requirements of the site Reuse abandoned buildings with new design materials and design methods, and then integrate them into the urban environment without losing the special memory of history and culture. The functional pattern of the site should also be coordinated with the space of the entire urban environment. Only by grasping this coordinated design scale can we realize a landscape design with a sense of design and a landscape design with unique urban characteristics.

4. Conclusion

The problem of industrial brownfields has become increasingly obvious under the environmental background of accelerating urban development in recent years. Industrial brownfield landscape design can not only further alleviate the environmental and social problems caused by the rapid development of industry, but also further promote the sustainable development of society. Industrial brownfield landscape design can create a relatively healthy landscape activity space for people, and then guide people to outdoor space for activities. Industrial brownfield management should not only consider the final landscape design effect, but also consider whether it can create a relatively healthy activity space so that the surrounding people can carry out some activities in the space.

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