

Analysis of Landscape Design of Roof Garden Based on Environmental Rehabilitation Concept-Discussion on the Design of Roof Rehabilitation Garden of the Second People's Hospital in Jingdezhen

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Abstract:

This paper is based on the landscape design concept of environmental rehabilitation, and combined with local ecological conditions, in the design process of transforming the Second People's Hospital of Jingdezhen City into a roof rehabilitation garden, innovative designs such as color matching, material selection and plant configuration have been proposed, which has maximized its ecological benefits. The outdoor landscape environment of the hospital has become an ecological rehabilitation garden, and it has become the best place for people to recuperate.

Keywords:

Roof Garden, Environmental Rehabilitation, Landscape Design

1. Introduction

With the rapid advancement of urban construction, the urban population has proliferated. Urban public buildings keep developing at high altitudes for more space, especially public medical resources such as hospitals. With the advent of China's aging society, hospital buildings can only be remodeled in a limited space. Patients are getting farther and farther from the ground and also further away from the green natural environment. A good hospital environment requires not only medical space, but also a space of entertainment, fun and leisure, a combination of openness and privacy, and an inspiring element that will regain a positive and positive attitude. The research content of this paper is to transform the roof of Jingdezhen Second People's Hospital into a roof garden, enhance its economic, ecological and cultural value with local resources. Its value is not only to add green to the city, but also to provide a safe and green place for patients who are not suitable for going out, while reducing the heat radiation on the roof of building materials, weakening the heat island effect of the city, and it also plays a leading role in the creation of the garden in the ecological construction of Jingdezhen.



Figure 1. The current roof status of Second People's Hospital.

2. Overview of the Roof of Second People's Hospital of Jingdezhen

The Second People's Hospital of Jingdezhen City was established in 1971 and is located in the center of the city. After half a century of vicissitudes, it has developed into a three-level general hospital integrating medical, scientific research, teaching, prevention, health care, rehabilitation and first aid. It is the Jingdezhen Hospital affiliated to Weinan Medical College, the teaching base of Nanchang University School of Medicine and Jiujiang Medical College, and the standardized training base for resident physicians in Jiangxi Province. There are 860 beds open for medical treatment, 50,000 square meters for medical business, nearly 400,000 emergency treatments, and more than 30,000 person-times a year. There are 11 medical buildings of various functions in the hospital. Among them, the medical technology building A and the medical technology building B in the center of the hospital are for the roof gardens. The two buildings are connected to each other and are all six-story masonry structure with a total construction area of 1920.97 square meters.

There is no reasonable connection between the main medical buildings in The Second People's Hospital of Jingdezhen City. The whole hospital area is blocked by hard roads. Moreover, it lacks humanization and visual scene. The isolation between buildings leads to the relative isolation of roofs. Some of the buildings are very old. The roof lacks reasonable maintenance, and exists damages.

3. Overall Design Concept

3.1. Design Principle

3.1.1. Functional Principle

Medical technology buildings A and B are the places where the patient's laboratory tests, MRI, B-ultrasound and other medical auxiliary examinations are in place. In the process of waiting for the examination, the patients and their families are inevitably nervous and anxious. Medical workers also accumulate tremendous pressure in high-

intensity work. The social function of the hospital is not only to provide medical services, but also humanistic care. Position the design project as eco-medical and healing landscapes here. The audience is the patient, the family of the patient, the medical staff, and the healthy person (pregnant woman, mother, newborn) who is in a physiological state to be determined, etc. Follow the design principles of landscape with service and landscape with healing. Combine with local ecology to improve the greening rate and pay attention to its particularity. Transform it into a place that provides a good healing environment for patients, rest and distraction for medical staff, and also a comfortable and elegant communication environment for patients and doctors, which helps to eliminate the nervousness of patients and medical staff and relieve their stress. Get a whole body relaxation and improve the overall medical environment of the Second Hospital.

3.1.2. Designed To Be People-Oriented

The main users in the hospital are patients. According to the "people-oriented" design principle, their special physiological and psychological characteristics should be given special attention. The design is mainly reflected in: a. the design of the protective fence. The height of the fence should be above 120cm, higher than the waist to ensure its safety and avoid extreme behavior; b. the design of barrier-free transportation in the whole park reflects the targeted function and humanized care.

3.2. Functional Partition and Landscape Composition

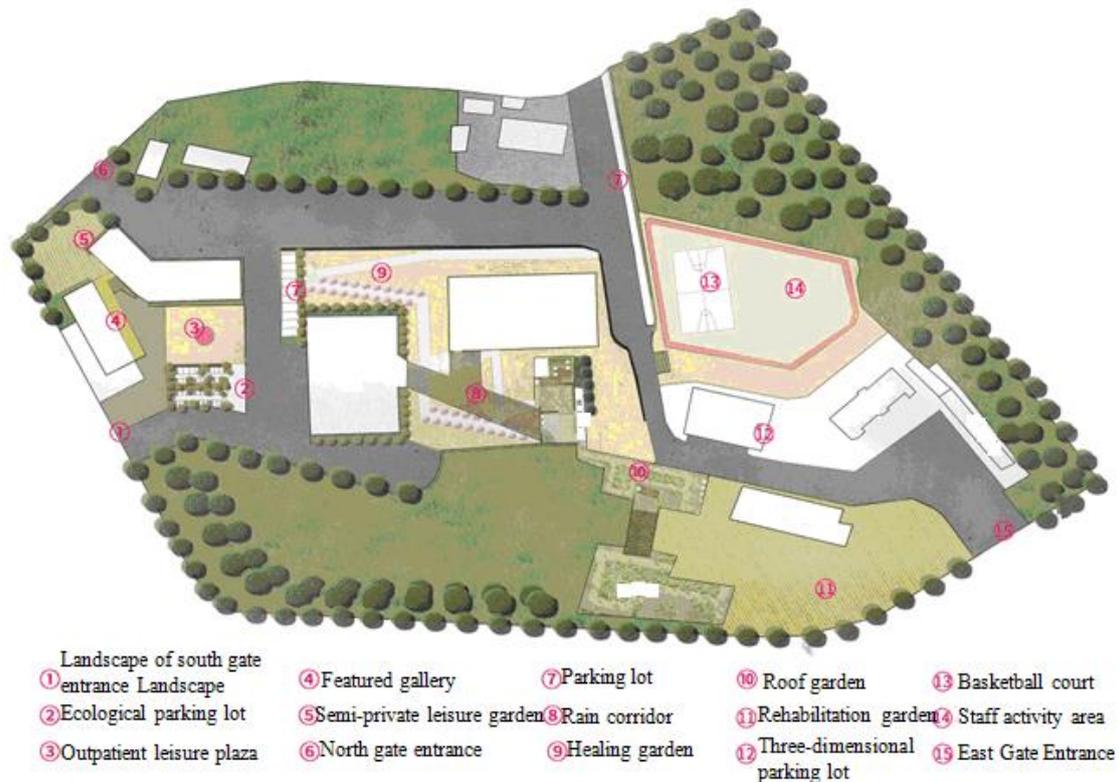


Figure 2. Floor Plan of Second People's Hospital.

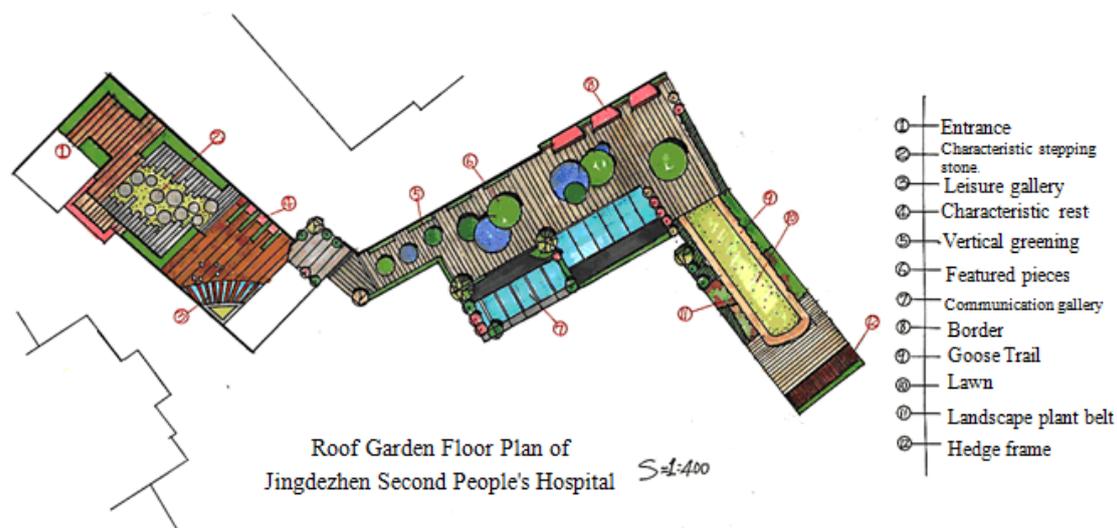


Figure 3. Roof Garden Plan.

In this paper, the whole roof area is divided into four functional areas: entrance area, viewing area, exchange area, and walking and leisure area. To the greatest extent, it compensates for the defects in the existing landscape space function of the Second Hospital and meets the requirements of patients and medical personnel. The roof garden built on the low-rise building provides a spatial sense of plant roof outline invisibly for the people of patients and medical workers when overlooking the window, a lush green landscape space.

In the whole area, in order to avoid the use of a large number of hard pavements, a large number of lawn paving can be used to walk and squat, and to adjust the mood. The whole design pays attention to humanistic care and integrates regional characteristics to design as a unique landscape space.

- a. The entrance area is mainly composed of green plants and soft pavements. The semi-enclosed space creates a fresh and mysterious space atmosphere that gives people a refreshing feeling. In order to relax the patients and medical staff, use round stone and fun paving to make them relieve fatigue and forget their troubles. Advance to a leisurely rest space, an open and semi-open resting place is created for sit-in or communication, and green partitions make the space more pleasant.
- b. The viewing area is mainly composed of landscape pieces, with circular flower beds, potted plants and pools interspersed. Group or single placement, and pay attention to the combination of density and increase the taste of the essay. The vertical greening of the wall makes the space more layered and divided into different types of communication space, so that the patient can enjoy the physical and mental pleasure while watching, and maintain certain privacy for people to communicate with each other.
- c. The communication area adopts a glass frame structure, in which the surrounding of the card holder is arranged to be surrounded by green plants. Create a relatively closed space for them to talk or rest. It's fun to listen to and watch the rain on rainy days. Take rehabilitation training with active physiotherapy equipment in the rehabilitation garden.
- d. The strolling recreation area is mainly set up with goose trails, lawns, green belts and hedges. Two chopped walkways with cobblestones help users relieve stress and

regulate mood. Proper exercise helps restore health. The green planting is planted with vine plants, which can be enjoyed in summer.



Figure 4. Roof Garden Rendering.

4. Design Innovation

In design, care about the continuity, order and unity of the roof garden landscape. Pay attention to the particularity of the landscape space of the hospital roof garden, and integrate it into functional spaces such as medical care and rehabilitation. In the meanwhile, pay attention to the selection of materials, considering the bearing capacity of the roof and its corrosion resistance.



Figure 5. Roof Garden Rendering

In the choice of color, it is necessary to consider the influence of different colors on patients and their different feelings. For example, warm colors give a lively and popular feeling that can effectively eliminate the image of the hospital's "cold". Use warm colors at the entrance to the landscape. Cool color gives a sense of solemnity and tranquility. It is often used in hospitals for rest, which can highlight the quiet

atmosphere. That is conducive to patients' rest and recuperation, and avoids affecting their emotions. When collocation, pay attention to coordination.

In terms of plant configuration, consider the plant's texture, shape, color, flowering and other factors to create a high and low patch, plant landscape changing in all seasons. It is recommended to use shallow roots, no corrosion or less corrosion of small trees, shrubs and ground covers. In addition, plants have a special function, namely aromatherapy. Choose easy-planting lavender, chamomile, etc., which can eliminate fatigue and relieve tension. There is a faint floral fragrance in the air, and the sound of nature is lingering in the ears, making people forget their troubles and enjoying the beautiful life.

About the selection of hard materials, considering the special outdoor environment of the roof, the design style should be well integrated with the building, and it should echo the architecture from the aspects of shape, color and material. Try to use materials that are lightweight, durable and resistant to corrosion.

The open roof garden of the hospital plays an important role in the rehabilitation of patients, and is an important part of the hospital's green space. It plays an important role in enhancing the environmental image and attracting patients. Therefore, the client should be fully considered as the patient and the medical staff. The choice and distribution of seat are also more important. The seat distribution should be free and flexible, which can give a kind and quiet feeling of space. Choose a wooden or rattan seat with armrests and backrest.

5. The Function and Significance of Building a Roof Garden in A Hospital

5.1. Ecological Benefits

"Hot Island Effect" is the city's illness. The second people's hospital of Jingdezhen is located in the center of Jingdezhen, and due to the hilly terrain, the entire hospital building is in a rising spatial sequence, which is not conducive to heat dissipation. The construction of the roof garden can increase the green area, which is 25%-35% higher than that of the ordinary roof. Besides, the transpiration of the plants greatly reduces the latent heat of the roof. The reduction of the indoor temperature on the top floor reduces people's dependence on air conditioners and is more environmentally friendly. Human nature is close to nature. As the "fifth side of the city", the roof garden effectively complements the green space in the vertical height of the city and has a positive impact on the improvement of the urban ecological environment.

5.2. Social Benefit

In the design of the roof garden, the introduction of low-energy technology (such as green roof and vertical greening), combined with the use of artificial planting soil and rainwater harvesting devices in the roof garden can effectively use natural rainwater. Reduce energy consumption and discharge pressure in sewers. And use the shading and photosynthesis of the plant itself to avoid the roof being exposed to direct sunlight and the temperature is too high, which can improve air quality and save energy. The energy and water of a single landscape may not be worth mentioning compared to the energy required to run a large building. But when multiple "not worth mentioning" comes together, it's an amazing number. The water resources needed for the maintenance of urban green space are enough to make some cities lacking water

resources in China stretched. According to authoritative statistics, by 2030, the national urban green space irrigation water demand will reach 8.27 billion cubic meters, which shows the seriousness of landscape energy consumption.

6. Conclusions

In this study, the purpose of this paper is to combine the roof of Jingdezhen Second People's Hospital with the local ecology and transform it into a roof garden. It will create a good rehabilitation environment for patients and a comfortable and elegant workplace for medical staff, which helps users to eliminate tension, relieve stress, get full body relaxation, good health and mental health, that is an important embodiment of the humanization of the landscape. At the same time, it will increase the greening rate and promote the surrounding environment construction, thus promoting the ecological civilization construction of Jingdezhen. It is also another development trend of rehabilitation design.

For all we know, the open roof garden plays an important role in the rehabilitation and convalescence of patients. But in real life, many hospitals are not aware of the vital importance of the open roof garden, and they abandon it or design it inadequately to make it less effective. In this paper, we introduce the concept of sponge city into the "roof garden" while designing rehabilitation garden. Compared with general hospital rehabilitation garden, this paper provide more significance of energy saving and environmental protection. It shows the combination of ecological cycle concept and technology. Water for plant irrigation comes from nature and is used for nature.

In terms of design shortcomings, there are slight deficiencies in the processing of spatial moving lines, and the overall road shape is comparatively single, and the landscape level is not rich enough.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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