

# Research on Landscape Planning and Design of Urban Street Green Space

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**Abstract:** Street green space is a type of street green space, and it is an important carrier of street space characteristics. At present, street green space has the phenomenon of loss and convergence of landscape characteristics. Starting from the definition and characteristics of street green space, the principle of creating street green space characteristics is put forward, and the method of creating street green space landscape design is analyzed from the aspects of paving, waterscape, topography, garden sketches and structures, and plants.

## 1. Introduction

Street green space is a new type of green space construction in China. It has emerged with the development of street green space construction and the actual needs of citizens. It combines the functions and advantages of squares and green spaces, providing citizens with an open space for activities and exchanges. This type of space has become more and more popular. As a space node closely connected to the street, street green space is an important material carrier that carries the spatial characteristics of the street square [1]. Features are the value embodiment of landscape design and the soul of construction. However, many existing green landscapes lack individuality, lack of features, and the phenomenon of landscape convergence. With the improvement of the aesthetic and spiritual needs of urban residents, the research on the construction of landscape features in street green spaces is imminent.

## 2. Characteristics of Street Green Space

### 2.1 Small Scale

It is different from large squares or parks, which are generally located next to urban roads or sandwiched between streets and buildings, so the area is not very large. With the twists and turns of the street and the relationship between the street and the surrounding buildings, it presents different shapes and is not fixed [1]. However, it has a suitable scale, has the function of expanding the street, and has the closest relationship with urban residents.

### 2.2 The Functions and Requirements Are Complex and Changeable

Due to the diversification of the urban environment, the design of street green spaces often faces different constraints and functional requirements. Street green space near residential areas is more inclined to meet the daily needs of residents, while street green space near commercial centres considers the needs of commercial squares [2]. In more cases, multiple needs and environmental backgrounds are intertwined. How to meet multiple needs in a limited space demands have challenged the landscape design of street green spaces.

### 2.3 Both Ecology and Openness

It is a new type of urban open space that can be entered at will. It provides citizens with a place for leisure, activities, exchanges and recreation. The organic combination and embedding of green spaces brings better ecological benefits and comfort for activities, and also makes the site better connectivity with the surrounding environment [1].

### **3. Principles of Street Green Space Design**

#### **3.1 Adapt to Local Conditions**

Adapting measures to local conditions is the basic principle of public green space design and an important source of street green space landscape features. Adapting measures to local conditions is first embodied in the analysis, selection, in-depth excavation and utilization of elements such as climate, topography, landscape, humanities, customs and habits within the scope of the design site, which is called “locality”. According to the characteristics of the site, the process of organizing various landscape elements, solving site problems, and even turning site disadvantages into advantages is the “conditions”. Different site characteristics, problem solutions and landscape construction techniques together constitute the basis of site characteristics [2]. Designs that are separated from site or site issues will lose the meaning of design. The so-called characteristics can only be formal characteristics.

#### **3.2 Ecological Principles**

The principle of ecology is embodied in respect of the laws of nature and ecology, and is currently mainly embodied in the application of new energy, site rainwater management and plant landscape construction. In the application of new energy, it is more reflected in the application of solar energy. Through the use of single pieces or solar energy storage systems, the maintenance of landscape effects can minimize energy consumption and clean energy; in the management of site rainwater, through roof rainwater ecologically sustainable rainwater control and rainwater utilization facilities such as collection systems, rainwater gardens, permeable paving, rainwater storage tanks, etc., make rainwater come from “nature” to “nature” and restore the original ecological intention of landscape design [3]. At the same time, reduce the pressure of municipal drainage and reduce the cost of landscape maintenance; in the construction of plant landscape, we must first respect the original local ecological community, try to preserve the original large trees in the site, and choose more native tree species in terms of tree species selection. The design needs to be scientifically configured to create a multi-layer community structure with reasonable structure, sound functions and stable populations to achieve the greatest ecological benefits in the limited green space.

#### **3.3 Aesthetic Principles**

The experience and feeling of beauty is an important part of the design characteristics. Most people's feelings of beauty are universal and common, and there are certain artistic rules to follow. In the design of street green space, art expression forms such as master and slave, rhythm and rhythm, contrast and unity, association and artistic conception can be used to process and control the space opening and closing changes, the performance of various landscape elements and the overall effect of the site. Participating in all aspects of landscape design in the form of beauty can make street green spaces more enjoyable, allowing participants to arouse inner joy and emotional resonance through visual-led aesthetics [3]. Because street squares are generally small in size and the surrounding environment is complex, the specific design needs to avoid the dull effects caused by overemphasizing the integrity of the design, and the messy and disordered site caused by overemphasizing changes.

#### **3.4 People-Oriented Principle**

The basic starting point of public space design is to serve people, and people-oriented will not let the design fall into a flashy situation. More and more meticulous human care itself can also become the highlight and feature of the design, such as parent-child seating, the elderly activity square, and the parent rest area next to the children's activity venue. In specific design, the people-oriented principle should run through all design links. From pre-market research to analysis of specific functions and audiences, from the location and quantity of the population to the guidance of the identification system, from the distribution of spatial opening and closing relations to the scale and specific layout of each space, from the combination of publicity and privacy to the convenient traffic flow, from the selection of hard decoration materials to the determination of plant planting strategies,

the deliberation and consideration of the design will sublimate to a truly comfortable landscape experience for the audience [4].

### **3.5 Principles of Integrating Regional Culture**

The integration of regional culture is an important way of expressing design characteristics, which can effectively avoid the appearance of uniform and one-sided landscapes to a certain extent. It is a common design technique to extract local representative elements such as symbols, images, and totems from the regional culture, and express them in various landscape elements. In the specific refinement process, methods such as borrowing, abstract simplification, exaggerated deformation, element reorganization, and scene reproduction can be used to make the symbols have both cultural characteristics and modern aesthetic characteristics [4]. But this is not a fixed model. Cultural manifestation is not only flat and static symbols, but also can be embodied in multiple forms such as texture, layout, color, size, etc. in landscape elements such as plants, waterscapes, paving, buildings, etc., not necessarily directly, but it can enrich the soul and connotation of the square in a subtle way, and make the street green space more cohesive, affinity and vitality.

## **4. Street Green Space Landscape Planning and Design**

### **4.1 Paving Characteristic Design**

Pavement carries the bottom surface of crowd activities. With the overall improvement of the landscape industry and the aesthetic level of citizens, the requirements for paving are no longer satisfied with basic practicality, and more are beginning to lean towards the needs of aesthetics, culture and taste. In addition, when the area of paving design is large, it is best to have colour skipping to avoid monotony and visual fatigue; changes in colour, material and other paving can also form a guiding role for tourists and guide tourists' routes [5]. Finally, the pavement design can also integrate the regional culture, using patterns, symbols, colours, text, arrangement and other cultural symbols and information integration to give the paving cultural connotation, make it more vital, and easier to bring to the citizens pride and belonging.

### **4.2 Water Feature Design**

As the most “smart” element in the landscape, water can not only add vitality to the street green space, but also adjust the air quality of the small environment and bring more popularity [6]. The characteristic design of waterscape can be considered from three aspects: waterscape form, coordination with other landscape elements, and more participation.

### **4.3 Topographic Feature Design**

Terrain is the skeleton of the street green space, and also the carrier of all landscape elements and spaces [3]. It determines the basic landscape effect of the garden and is an aesthetic element and a practical element. In terms of the scope of the garden, the terrain includes mounds, terraces, slopes, flat land, and terrain with changes in water level caused by steps and ramps [5]. In the specific design, relying on the original topography and maintaining the original topography to the greatest extent is the first design principle. This is the respect for the site characteristics and the embodiment of the economic principle. When the site is relatively flat, the terrain is mainly used to block interference to form a private space or enrich the landscape effect of large-scale planting [4]. Terrain changes can provide a diversified environment, improve local microclimates, and provide a substrate for the realization of landscape hierarchy and plant diversification.

### **4.4 Characteristic Design of Garden Sketches and Structures**

The amount of landscape sketches and construction objects is small, and the number of street green spaces is also small, but it is easy to form a visual focus. The small and beautiful design on the focus unit can highlight the characteristics of the park and enhance the artistic and cultural atmosphere [5]. There is a big disparity between the structure and the garden sketches in terms of volume, but there are similarities in the characteristic design. The choice of materials and the integration of local culture

are important factors that affect the effects of landscape sketches and structures. First, when landscape materials are used in urban construction, they are not only the constituent elements of urban characteristics, but also the memory and understanding of urban residents of urban development. It is an important aspect that constitutes urban regional characteristics [6], and more and more batches, The landscape decoration materials produced by template production greatly and quickly meet a large number of construction needs; at the same time, the application of new technologies can quickly form visual effects and modern effects, greatly enrich the texture and colour of the landscape, and open up new landscape design. Possibly, it also poses a challenge to the reflection of regional culture. In order to avoid the problem of lack of regional characteristics and unification of the landscape, the balance and selection of materials are the key to the design; in addition, the process of integrating culture into the landscape is integrated in the design of landscape sketches and structures the process of form, technology and design thinking should have a unique and innovative process, rather than a mechanical copying process [6].

#### **4.5 Featured Design of Plant Configuration**

Plant configuration characteristics can generally be reflected in two aspects: plant variety selection and plant configuration strategies. In the selection of plant species, native tree species are the mainstay. Appropriate addition of exotic plants with strong adaptability and high ornamental value can better reflect regional characteristics and culture. In the design, attention should be paid to the ratio of arbour, shrub, and grass, as well as the ratio of evergreen trees to deciduous trees, taking into account ecological benefits and landscape effects [7]. At the same time, attention should be paid to the selection and use of flowering shrubs and ground cover plants to create a colourful plant landscape; In terms of plant configuration, it should be ensured that the plant configuration method is the same as the overall style of the plan design. The density and the richness of the configuration should be determined according to the spatial opening and closing relationship in the overall design, and the richness of plants should be reflected through changes in density, light and shade, movement and static. The spatial form brings different psychological experiences to tourists. In addition, the plant design also needs to have key points, according to the overall landscape node requirements, make differentiated landscape key points [7]. In terms of configuration effects, it is necessary to fully consider the colour beauty and seasonal beauty of plants, and consider different tree shapes, leaves and seasonal changes to form a rich plant landscape.

### **5. Summary**

With the rapid development of society and economy today, people's living standards are constantly improving. In order to further improve the living environment of urban residents, it is essential to carry out urban greening work. The article introduces the design method of urban street garden green space landscape. Practice has proved that through the scientific design of street garden green space landscape, not only can improve the optimization of the urban ecological environment, improve the quality of life of urban residents, but also help promote the harmonious development of economy and nature, and is beneficial to the smooth realization of the sustainable development goal of urban economy.

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