



## The Principles of Configuring Landscape Plants at Campus Edge

LIU Long<sup>[a],\*</sup>

<sup>[a]</sup>Henan Polytechnic University, Jiaozuo, China.  
 \*Corresponding author.

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### Abstract

Based on the specific regional culture, targeted at configuration of landscape plants at the edge of campus, this article studies the selection, art, culture, function and ecology of plants, and highlights the principles of people orientation and harmonious humanity. It takes Henan Polytechnic University as an example, puts forward the principles of planning landscape plants at the edge of campus, and explores new ideas for designing the spaces at campus edge.

**Key words:** Campus; Landscape at the edge; Plant configuration

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### INTRODUCTION

School, especially in college, is the bearer and disseminator of human cultures, and also the soul of the culture of a city. School depends on society to survive, and society depends on school to sublimate. In recent years, China attaches great importance to education. Responding to social needs, colleges and universities continue to expand, innovate educational ideas, create good campus space, enhance and enrich the functions of the space at campus edge. School is poised to become an integral part of the social factors of production, accumulates to form a spirit and a concept. It is also the presence of material carrier and physical performance, which are different from

society with its own characteristics. It forms a specific area centered on campus and commanding material, culture, technology, humanity and life, which are called as campus. Since there is a space, it is necessary to carry out effective planning. This planning and design made for the learning, leisure and landscaping of teachers and students is called as campus landscaping. Landscape at the edge of campus is not only a tie connecting college and city, but also a demonstration of the spirit and culture of a campus. Due to the historical, realistic and uncertain objective reasons, and subjective reasons of designers' understating, ignorance and technological support, space at the campus edge develops far behind, whose characteristics are eclipsed. In campus planning and design, the unique locations within and outside the edge of college campus have important functions, becoming the premise for planning and designing the space at campus edge. Based on the theories of urban planning, campus planning and botany, etc, associated with cases studies at home and abroad and characteristic college case investigations, this article explores new ideas of designing space at the edge of campus.

### 1. CONCEPT OF CAMPUS EDGE LANDSCAPE

Edge, refers to the connecting portion of two objects or two environments, is a belt-shaped space reflecting different natural characteristics, social environments, space properties and land properties. As a defined area located in a city, college forms a defined edge with the surroundings, producing the inside campus area and outside campus area. College edge area refers to the belt-shaped space connecting campus and city, and is the transition area of integral campus environment and adjacent areas. In order to unify the overall landscaping of the campus, the landscape planned and formed at the campus edge is called as campus edge landscape.

## 2. THE SIGNIFICANCE OF CAMPUS EDGE LANDSCAPE RESEARCH

Edge is not a destination, but a beginning, and plays an important role in support and connection. As the important part of college campus, campus edge area is the boundary as well as the integration point of campus and city, playing an equally important role in overall campus planning. The landscape at the edge of campus is not only an interface to reflect the culture and spirit of campus, but also a channel to exchange materials, information and energies. In addition, the inside campus landscape and outside campus landscape inter-depend on each other, serve more people, and greatly expand sightseeing, activities and usages. Campus landscape begins with campus edge landscape, and also ends at the campus edge landscape. At present, China attaches growing importance to education, and college construction also ushers in a new historical period. The positive factors and negative factors coexist in college edge construction, and challenges also go alongside opportunities. In this circumstance, the necessity of research on campus edge landscape has been highlighted. Its research has theoretical as well as practical significance, and may fill the blank areas of theories in plant configuration in the campus edge landscaping.

## 3. PRINCIPLES OF CONFIGURING PLANT LANDSCAPE AT CAMPUS EDGE

### 3.1 Principles of Selection and Collocation of Plants

#### 3.1.1 Plant Trees According to Terrains and Based on Native Tree Species

Plant trees according to terrains, are to plant trees under suitable environmental conditions to promote their growth and give full play to their functions. Native tree species are the most adaptable to local natural conditions, have strong resistance and are easier to survive. Landscape plants should be diversified, which is an objective requirement of campus ecological construction, but should focus on key plants, especially a backbone species to represent the campus landscape characteristics, especially in a campus edge landscape with complex traffic; They should also have the advantages of strong adaptability, strong resistance to diseases and pests, healthy growth, easier cultivation and management. Plant trees based on native tree species. The selection of native tree species as the backbone trees can not only reduce economic costs and improve the efficiency of input and output, and more importantly, can highlight the local characteristics, regional cultures and humanistic characters. Poplars, willows, elms, locusts, Chinese toons and other native trees widely spread in Henan Province, though in the

complex and diverse local climate and soil conditions, as well as simple and extensive management conditions, still fully demonstrate their biological properties and good viewing.

#### 3.1.2 Plant Grasses at the Bottom, Arbors as the Main Trees, and Be Supplemented by Bushes and Combine Evergreen Plants With Deciduous Plants

Plant trees are based on arbors and be combined with shrubs and grasses. Arbors can serve as sidewalk trees, shade trees, and may also be used as the main row plants at the campus edge. The use of a variety of shrubs and vines with flowers, fruits and foliage can reflect the richness, diversity and hybridity of landscape at the campus edge. Meanwhile, the combination of arbors, shrubs and grasses can establish a rational artificial plant community and keep plant diversity, increase stability of the community, and strengthen the recreation and viewing functions of edge landscape. If tall arbors are planted as the main trees at campus edge, they can form the boundaries and buffer areas dividing campuses, and reflect different cultures and lifestyles.

In the northern regions, deciduous trees are the main tree species, and evergreens and arbors play an important role in improving winter ecological environment and visual aesthetics. Based on local climatic conditions, we should choose evergreen and deciduous plants in appropriate proportions for configuration. In Henan Province, the suitable evergreen plants are cedars, arborvitae, and ligustrums, etc, and the selectable deciduous plants are sycamores, and sophora japonicas, etc..

#### 3.1.3 Adopt a Variety of Planting Forms in Accordance With Section Features

According to local environmental conditions and overall layout requirements, we should adopt different forms of cultivation. Generally, landscape near the campus gate uses more regular-based cultivation, including opposite planting, row planting and so on. The corner of campus edge should adopt natural style plantings, including solitary planting, clump planting and so on. Landscape planting in this particular area should make full use of the natural shapes of plants, rather than conduct nursery planting. Henan Polytechnic University South Campus has a flat terrain, and the landscape is in rectangular distribution. We need to consider the characteristics of plants, combine regular style with natural style for the most appropriate planting.

The scenery of landscape plants changes with the seasons. We need to configure according to segments so that each segment can highlight a topic of landscaping, and have ups and downs in unity. The edge landscapes of Henan Polytechnic University South Campus are mainly distributed in the west side line, south side line and east side line. These lines are also demarcated by the west gate, south gate and east gate. We can make good use of

this demarcation to configure, and allocate each line with a specific topic. The key areas, such as the areas near the gates, are places where people are more concentrated. We should take into consideration an enjoyable scenery for four seasons, and even a single season dominated area should be embellished with plants in other seasons. Plant configuration in campus edge should combine plane greening, vertical greening and water greening to increase three-dimensional space art. Landscape should include shade trees, garden trees and flowering shrubs, etc. and be embellished with flower beds, pergolas, flower pieces and other decorations.

We should depend on plant species and growth characteristics to determine configuration density. A scientific and moderate density of plant configuration has a direct impact to greening effect. In accordance with species characteristics and growth cycle, we can take a combined method of short-term and long-term, and determine the density according to a tree's future canopy coverage. We should plant more transitional flowering shrubs in thin planting. The focus of campus edge landscaping lies at the vicinity of the gates, because the gates enable teachers and students to enter and exist, and reflect the aesthetic appearance of the campus. The areas near the gates are suitable to plant tall and beautiful trees to constitute a spacious, shady and formative green channel.

### **3.2 Art Principles of Plant Configuration**

#### **3.2.1 Art of Plant Viewing**

Art of plants is extremely important in the overall layout of edge landscape environment and landscape design, and in the design process, it is one of the factors to be studied firstly. Art of plants has a direct relationship to the diversity and unity of a design, emotional and visual experience as well as the atmosphere and mood of an outdoor environment. Therefore, in a landscape design, we should take into account other relevant factors while considering a certain artistic factor, combine all relevant factors and make them complement each other to enhance all ornamental characteristics. In artistic selection, we need to focus on the size, shape, color and texture of plants to enhance ornamental art.

#### **3.2.2 Art of Plant Configuration**

An artistic creation of delicate, complex feelings of multidimensional space depends on the application of painting, literature, aesthetics, sculpture and acoustics, which is based on natural beauty, social life, and is carried out in accordance with aesthetic law. This is called as garden art. The art in spacial plant landscape at campus edge needs to learn and apply a variety of artistic means, fully make use of shape, line, color and texture of plants, in accordance with seasonal changes and life circles, apply diverse and unified, coordinated and contrastive, balanced and stable artistic means to create living and dynamic art works.

### **3.3 Cultural Principle of Plant Configuration**

Chinese traditional culture is profound with a long history. It takes social ethics as the core, involving the natural world and reflecting a harmonious coexistence of man and nature. Colleges shoulder the responsibilities to train talents, spread and develop science and culture. As the link connecting college campus and society, campus edge landscape should not only heighten campus culture and spiritual atmosphere, but also pay attention to shape spiritual environment, so that students can "be educated in scenery", neighboring social groups can imperceptibly cultivate noble characters, morality, cultural and artistic sentiments, and "environmental education" can be realized. Cultural connotation is an integral part of plants, and we can make good use of the "cultural properties" of plants to create unique cultures in creation of plant landscaping.

### **3.4 Function of Plant Configuration**

Landscape green space is multi-functional, and the plant community at the campus edge tends to have specific functions and focuses in certain regards. Campus edge landscape can not only protect environment, but also serve as a transition area between campus and community, improve the campus environment image, and provide a casual place for different groups of people inside and outside the campus. The residents near Henan Polytechnic University South Campus are not many. The main role of the campus edge landscape is to beautify the environment, and connect the school region and social region.

### **3.5 Ecology of Plant Configuration**

The natural habitats of plants play an important ecological role in reducing artificial energy consumption and environmental load. As the major component of campus and urban structures, campus edge space maintains the systematic balance of ecological environment, and provides powers for material and energetic conversion in an urban ecosystem. In the long-term evolutionary and growing process, plants have established certain requirements on temperature, soil, light and water. Henan Polytechnic University South Campus, for example, is located in Jiaozuo City, Henan Province, having a temperate monsoon climate, more dust and sandstorm weathers and most sandy loam, suitable to plant the trees which can tolerate higher dust, soot pollution, and have no strict requirement on soil, such as ligustrums and sophora japonicas, etc..

### **3.6 Humanity of Plant Configuration**

All landscapes are designed for people. "People-oriented" has become the core guiding ideology of design, and so does plant landscaping at campus edge. In configuring plant landscaping at campus edge, the first is to ensure the plant space have continuity, harmony and obvious sequence to give a clear feeling of space, and with an overall sense of space, to produce changeable styles and a

variety of scenes. Garden paths, garden chairs, footsteps and other facilities in a plant space should meet human needs, reflect human scale, and comply with ergonomic requirements; Secondly, considering a variety of natures and statuses of a plant space, we need to also pay attention to people's feeling when they stay inside the plant space.

### 3.7 Personalization of Plant Configuration

Though colleges in different regions and countries, with different histories share a common origin of human civilization, they are also deeply rooted in their unique environments, and form distinctive traditions and styles in the long-term development process. Therefore, plant landscaping at a campus edge should be implemented in accordance with the regional characteristics, natural resources and human resources, based on the college nature, running purposes, professional features and coverage levels, etc. to demonstrate its own style and characteristics. Agricultural and forestry colleges, for example, should combine teaching with research, grow diverse plant species and state species of plant families to carry out education and popularization of botanical knowledge for teachers and students; Normal colleges can plant more peaches and plums, indicating having students all over the world.

### CONCLUSION

College is the carrier for outstanding culture communication and the sign of human civilization development, playing an important role in inheriting and developing human society. Campus planning, design and research have become a hot topic in the new college construction and development period. Theoretical research and construction practice can not just focus on creating the interior space of campus, but ignore the campus edge space connecting campus and city. The relationship between college development and city development is not

only reflected as the interference and restriction of the city to college, but is also reflected as the growing influences of college to city, and is best to reflect as interaction and complementarity. As the tie combining college and city, the surrounding space of the college campus is necessary to draw enough attention from planners. We should update concept timely, attach importance to the edge space research, implement conscious guidance and control on policy, planning and design methods, help to optimize the structure of campus, enhance the overall sense of space and sense of belonging of campus environment, promote heritage of urban culture and development of urban spirit, and fully realize the communication between campus and city. We should work on how to rationally organize various landscape elements, configure scientifically according to local conditions, and create resource-saving and environment-friendly campus edge landscapes. Based on the tentative analysis of plant configuration at campus edge, taking the Southern campus of Henan Polytechnic University as an example, this article intends to arouse people's new understanding and new location on the regional landscape, and arouse people's attention to its social significance and prospects.

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