Landscape Design of Road Environment based on Computer

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Abstract. The environmental landscape design of the road is an important embodiment of the historical background and cultural accomplishment of a city and a region. In the computer age, environmental landscape design becomes more simple. This paper mainly describes the main principles and design ideas of computer-based road landscape design. This paper also put the idea of green design in landscape design.

Keywords: Computer, Road, Environment Design

1. Introduction

The traditional landscape design of road environment is carried out manually. In today’s computer age, all kinds of technologies are rapidly updated and improved. Compared with the traditional road landscape design, the computer-based road environment landscape design will be more simple[1].

Generally speaking, the design of urban road landscape should reflect the theme of people-oriented. Its function is to make people feel that there is a safe, environmentally friendly and comfortable road system in the city. The function of road environmental landscape design should include four aspects. They are: the improvement of traffic comfort, comfortable urban space, outstanding visual effect and humanistic quality.

2. The main principles of road environment landscape design based on computer

2.1. Comprehensive design according to local ecosystem

Landscape design should maintain the basic topography and landform of the city. It should integrate the road with the surrounding ecological environment. It should avoid cutting off the ecological environment space. Different planting methods should be adopted in different areas. Native trees should be used. Only reasonable collocation can reflect the diversity of biology and landscape.

2.2. People oriented
Generally speaking, safety and comfort are important goals of road landscape design. In landscape design, designers should fully consider the size of visual space, the color and size of safety facilities. In addition, the diversity of road landscape and the psychological factors of visual guidance should also be considered by designers[2].

2.3. It's very important to combine the distance and the near

Generally speaking, road landscape design should be based on the future and the present. Therefore, designers should consider the social, economic and ecological benefits of landscape design. The social benefit mainly refers to the expression of the city's humanistic quality, the city's historical connotation and the city's color culture. Economic benefit mainly refers to the cost of landscape design and the economic problems it brings. If a city mainly relies on tourism to develop its economy, it can rely on its own road landscape design to attract tourists. Ecological benefit mainly refers to the specific impact of landscape design on the surrounding environment. Landscape design shall not damage the surrounding ecological environment. Its existence should be integrated with the environment. This can not only ensure the environmental protection, but also ensure the visual enjoyment[3].

2.4. Pay attention to the expression of computer design

Generally, the computer environment landscape design is based on the way of network mapping. Designers need to express their design ideas and design skills to customers. Sometimes, landscape design which can not be expressed by two-dimensional drawings can be expressed by three-dimensional drawings. Many people think that two-dimensional drawing is difficult to express the specific design concept. This statement is wrong. In many cases, the main reason why the design concept can not be expressed is that the drawings are not clear. Two dimensional drawings are usually represented by three views and isometric drawings. However, if the design of a designer's drawing is not excellent, I suggest that the designer should adopt the way of 3D drawing for landscape design.

3. Determination of the theme of road environment landscape design based on computer

It is abstract to use the computer design method to design the urban road landscape. Designers must use simple design to create a beautiful and generous green space to promote the construction of ecology. People-oriented ecological environment space is essential in the design concept[4].

Without a good composition of vegetation ecological landscape community, landscape design is well integrated into the natural environment. This kind of landscape can not be recognized by people. There are four important goals of landscape design. They include: improving the use function, reducing environmental pollution, enriching road design and integrating green ideas (see Figure 1).
4. Landscape design of road environment based on computer

4.1. Design of green belt

The design of green belt is the most basic way of road design. It can visually make the road look like a beautiful green corridor. The design of green belt can satisfy people's visual aesthetics. In addition, it can reduce dust and noise. It is worth noting that the selection of tree species should be based on the local climate conditions.

4.2. The design of the green belt separating the machine and the non machine

Generally speaking, the design width of the separation green belt of motor and non motor vehicles shall not be less than 1 m, and the separation green belt of motor and non motor vehicles on the main road shall not be less than 2 m. At the same time, the design of the Green Belt should not hinder the driver's vision. It should be designed to avoid traffic accidents. In order to ensure the beauty, plants can be planted according to the way of geometry.

4.3. The design of the central green belt

The purpose of the green separation strip in the middle of the road is to block the light, prevent dizziness and guide the line of sight. Its design is conducive to the safe passage of vehicles. Therefore, experts believe that the width and height of the Green Belt should meet the requirements of the standard specifications. Designers should choose low growth trees. Generally, the single spacing of the separator should be between two and three meters.

4.4. Design of important nodes

The node of the road generally refers to the intersection of the road, the change point of the traffic route and the visual focus of the spatial characteristics. Node landscape is a green belt set up on the important nodes of road positioning. It can enhance the road identification, symbolism and city culture. It can
highlight the cultural connotation of a region\cite{5}.

5. Selection of plants and street furniture in road landscape design

Generally speaking, the selection of plants in the process of road landscape design is very important. Designers should give full consideration to the color matching of plants. According to psychologists, proper color matching of road landscape can make drivers more pleasant to reduce traffic accidents. The selection standard combination of plants for road landscape includes backbone trees and characteristic trees, trees, shrubs and flowers. In addition, the designer should also consider the particularity of the road environment and the dust retention of the plant area.

Street furniture is a unified name for all the facilities in street space. It mainly includes signs, sculptures and traffic signs. Street furniture can provide people with rest and physical and mental pleasure. The design of street furniture should get rid of the old ideas and emphasize the beauty of form. Beautiful street furniture can add a lot of fun to the street and save a lot of space.

6. Application of computer in landscape design of road environment

6.1. The expression of general layout in CAD

According to the above description, we can find that there are many elements in landscape design. It includes plants, buildings and topography. These elements are very complex. We can use the powerful drawing ability of CAD software and the ability of editing drawings to help designers fully express their design intention. This kind of drawing expression can also help customers to see the road landscape form after design intuitively. It should be noted that the use of CAD requires long-term practice and long-term learning\cite{6}.

6.2. Combination of CAD software, 3D software and image design software

CAD can be used for basic road landscape design. It has great limitations. Limitations mainly include: low accuracy, less color change and two-dimensional rendering is not delicate. We can use the combination of 3D rendering and image design for advanced environmental landscape design. We can also introduce animation technology. It should be noted that the introduction of animation technology is very complex. If the cost of design is not high, we do not recommend designers to use animation technology.

6.3. The design cost can be estimated by computer simulation software

The cost of every environmental design is the concern of customers. Designers also need to analyze the cost of environmental design according to the cost requirements stated by customers. This kind of cost analysis can be simulated by some simulation software of computer. The designer infers the approximate amount of design cost according to the simulation results. According to the customer's regulations, the designer will make the next modification and arrangement.

7. Conclusion

The use of computer makes environment design more simple and intuitive. Nevertheless, the designer
should also make clear the design principles of the corresponding road landscape. In the process of road environment design, designers should make full use of the convenient design skills of computer technology. Designers should design beautiful and low-cost landscapes according to the specific needs of customers. This is also the most deficient part of today's road design.

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