

The Color Elements of Low-Carbon Green Concept in the Architectural Landscape

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Abstract: *As the country continues to attach importance to environmental protection, the concept of low carbon and green has been widely used in the design of various architectural landscapes, which has brought a greater boost to the development of the construction industry. With the continuous increase of various construction projects, the demand for energy is also increasing. Therefore, the development of new energy has played an important role in the architectural landscape design. With the continuous improvement of people's living standards and the importance of building green and environmental protection, how to reasonably highlight the concept of low-carbon and green environmental protection in the color design of landscape architecture has become a major challenge and higher technical requirements for architects. This paper conducts research on the analysis of the color elements of the low-carbon green concept in the architectural landscape. Based on the online management information, it has a simple understanding of the application of the low-carbon green concept in the architectural landscape, and then proposes the low-carbon green concept in the design principles of the color elements in the architectural landscape. In order to further understand the color element design of the low-carbon green concept in the architectural landscape, a questionnaire survey was conducted among the students and teachers of the School of Architecture. The application of low-carbon green concept is mainly the color design of lighting accounts for about 42%, and then the color design of the environment.*

Keywords: *Low-Carbon Green, Architectural Landscape, Color Elements, Green Environmental Protection*

1. Introductions

With the continuous development of the country's social economy, the process of industrialization has gradually accelerated, leading to energy shortages and causing greater damage to the natural environment [1-2]. Therefore, it is imperative to develop new energy in architectural design, which is of great significance to the protection of the ecological environment [3-4]. As the country pays more and more attention to environmental protection, the concept of green and low-carbon emissions is gradually introduced into the color design of the construction industry landscape [5-6], aiming to create a more comfortable and environmentally friendly building environment to better meet user needs, to meet social needs [7-8].

In the analysis of the color elements of the low-carbon green concept in the architectural landscape, some researchers have suggested that it is more common to introduce natural elements such as sunlight and greening into the atrium of modern buildings. Green roofs and climbing walls have a long history, but the emergence of a large number of new green gardening technologies has allowed landscape plants to get rid of the constraints of land and even soil more and more, and can interact with various structures such as building roofs, walls and windowsills free combination of parts [9]. In addition, the various concepts of researchers in contemporary architecture have introduced a large number of plant landscapes into the interior space and outer shell of the building, which has become a significant innovation label. Their emergence is related to the ecological crisis and environmental awareness of contemporary cities. They hope to adjust the urban climate and change the severely separated relationship between man and nature [10]. The development of the architectural form of horticultural architecture has prepared the technical framework and morphological paradigm for the emergence of architectural integrated agriculture. For the plants entering the building, it is nothing more than replacing the ornamental ones with edible ones, but this replacement has brought a more

comprehensive and profound social, economic and environmental impact. Some researchers have proposed that the emergence of facility agriculture with greenhouses as technology is an important symbol of the development of modern agriculture [11]. Agricultural buildings control environmental conditions according to the needs of agricultural production, and develop a more mature technical system, including technologies for efficient use of space, heating, cooling, heat preservation, insulation, lighting, ventilation, and even rainwater collection, waste water recycling, and garbage disposal and other ecological technologies [12].

This article studies the color elements of the low-carbon green concept in the architectural landscape, based on the literature research methods. The application of the low-carbon green concept in the architectural landscape is summarized, and then the design principles of the color elements of the low-carbon green concept in the architectural landscape are put forward. In order to further understand the relevant actual situation, this article designed a simple questionnaire survey, based on the questionnaire survey the results draw relevant conclusions.

2. Research on Low-Carbon Green Concept and Color Elements in Architectural Landscape

2.1 Application of Low-Carbon and Green Concepts in Architectural Landscape

(1) Lighting design in architectural landscape

In buildings, the lighting system occupies a very important position, so there are generally a large number of lamps in the building. Extensive use of light bulbs will not only consume a lot of electricity, but also some light bulbs will have a greater impact on people's normal life. Therefore, the designer can rationally utilize the natural resource of sunlight when designing. Through effective design, sunlight can be introduced into the room, while providing lighting effects, the indoor environment has also been well improved, saving energy. Lighting design should also consider the environment and background. If the environment is very dark, you need enough light to illuminate the main body of the building; if the environment is very bright, you should amplify the light to highlight the main body.

(2) Energy-saving design in architectural landscape

When applying the design concept of environmentally friendly and energy-saving buildings, the related manual design is mainly considered from three aspects: the overall construction of the building, its orientation and the surrounding climate. When landscape designers design, because the heating and ventilation of buildings will be affected by natural conditions, designers must rationally design the heating and ventilation system channels according to the characteristics of climate, sunlight and natural wind into the room to achieve energy-saving effects. The main orientation design of the building must take into account the design of the ventilation system and the heating system. Therefore, the designer must conduct a logical analysis of the relevant data in order to plan the orientation reasonably. The main structure of the building determines the demand for its building materials, so designers must save energy as much as possible to meet the needs of users, so as to reduce construction costs and increase resource utilization.

2.2 The Principle of Applying Low-Carbon Green Concepts to the Color Elements in the Architectural Landscape

(1) Respect nature and protect the balance of ecological environment

Complying with the natural environment means minimizing the thought of construction and highlighting the characteristics of nature and the environment as much as possible. Use some natural resources, such as the use of green plants, and place the artificially constructed content behind the green plants, so that the green plant landscape can play a leading role. Protecting the natural environment is the use of environmentally friendly building materials, technologies and construction methods. Low-carbon green building materials have many advantages, such as consuming less energy, requiring less maintenance, and providing healthier environmental functions. Based on the above reasons, architectural landscape needs to find ways to improve the correct use of natural factors in architectural design, use more green and low-carbon materials, and make more use of various clean energy, solar and wind energy. Through these measures, natural elements are integrated into the landscape design and also help people feel the natural environment.

(2) Taking into account the construction technology, local culture and environmental conditions

The architectural landscape must be appreciated and accepted by people as a kind of landscape. Low-carbon design is not a form to be expressed, but to become its inherent quality. As a kind of landscape, it is necessary to consider how to enrich the local rich culture, how to integrate environmental factors, and form a systematic, connotative and key art form, so that people can subconsciously enjoy the protection of low-carbon environment, appreciation of culture, appreciation of nature, and enjoyment of the body and mind delightful.

(3) The principle of harmony between architectural landscape and environment

The architectural landscape must be designed as a natural coordination situation, which can connect and interact with the natural environment. It must be able to attract elements from the natural environment to the architectural landscape, such as a green bonsai, to make it completely natural. In the process of design and planning integration, specific environmental conditions must be fully considered in order to achieve maximum environmental benefits. At present, there are mainly two aspects of the environment to be considered: the natural environment and the social environment. Appreciation of the natural environment ranges from mountains, rocks, lakes, and seas to flowers, birds, and trees. How broad the design idea is, there is a broad reference background. The main content of the social environment includes history and humanities, intimate life and architectural features. Following the trend, we must not only have its own characteristics, but also show the harmony of the environment, but also ensure the protection of the environment, and use the concept of architectural aesthetics to realize the concept of protecting the low-carbon environment.

3. Investigation of the Application of Low-Carbon Green Concepts in the Color Elements of the Architectural Landscape

3.1 Questionnaire Survey

(1) Establishment of the survey object

This survey is aimed at the analysis of the color elements of the low-carbon green concept in the architectural landscape. Therefore, the target of the establishment is the students and teachers of the architectural design school. In order to reduce the difficulty of carrying out the survey activities, this survey is mainly carried out in this city. It is convenient to carry out survey activities and to ensure that the survey results are supported by enough data. Therefore, it is determined that the location of the survey is a university in this city, and 3 universities with different reputations are randomly selected for the survey. Because this activity is mainly aimed at universities in this city, so the results are not universal, so the results this time cannot explain the application of low-carbon green concepts in other regions to the color elements of the architectural landscape.

(2) Determination of the number of questionnaires

The establishment of the number of questionnaires is the most basic step of the survey activity, because the number of questionnaires is related to the validity of the survey results. If the number of questionnaires is set too low, the results of this survey will be questioned because the base of the data is not large enough and the results of the survey will not be large enough. It is universal. The number of questionnaires is set too high, and the difficulty of the questionnaire survey activity increases. Therefore, the number of questionnaires this time is set to 200 according to the minimum sample size proposed by the experts and the technical conditions of this survey.

(3) The distribution process of the questionnaire

The issuance of this questionnaire is mainly divided into two stages. The first is the issuance of the questionnaire, and the second is the recovery of the questionnaire. In order to ensure that the results of this survey have greater authenticity, the recovery of the questionnaire will be completed after the questionnaire is issued. Recovered in the next six days, given time to fill out the questionnaire completely. 189 questionnaires were recovered, and the recovery rate this time was 95%.

3.2 Data Processing

(1) When performing correlation analysis on the collected data, the data must be classified and sorted. This will not only increase the utilization rate of the data, but also promote cross-data analysis. Therefore, the main consideration is the completeness and accuracy of the data. First of all, about data integrity. When the questionnaire is delivered to the sample subject for completion and collection,

some sample items are arbitrarily completed, or their selection cannot be completed, which will cause some data sorting problems, but because the retrieved data accounts for the majority, so deleting the lost data means deleting the lost data. Secondly, the precision and accuracy of the data. When conducting an audit, the main consideration is to check whether these data are inconsistent with other choices, or the principle that conflicts with them should be selectively removed but as much as possible should be retained.

(2) The main meaning of a correlation relationship in the objective correlation analysis method is to generally refer to a certain relationship between various objective phenomena, but they are not strictly corresponding to each other in quantity. There are two main forms of determining the relevant properties of objective phenomena here: qualitative analysis and quantitative analysis. The main purpose of qualitative analysis is to rely on the scientific theoretical knowledge and practical experience of the researcher to accurately judge whether there are correlations between various objective phenomena. Or what kind of factor, the subjectivity of this analysis method is relatively strong. Among them, the commonly used calculation formula is expressed as:

$$r = \frac{S^2_{xy}}{S_x S_y} = \frac{\sum(x - \bar{x})(y - \bar{y})/n}{\sqrt{\sum(x - \bar{x})^2/n} \sqrt{\sum(y - \bar{y})^2/n}} \quad (1)$$

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2} \sqrt{n \sum y^2 - (\sum y)^2}} \quad (2)$$

4. Analysis of Survey Results

4.1 Whether to Apply Low-Carbon and Green Concepts in Architectural Landscape Design

A questionnaire is used to collect whether students and teachers will apply low-carbon and green concepts in architectural landscape design. The results of the survey are shown in Table 1:

Table 1: Whether to apply low-carbon and green concepts in architectural landscape design

	A college	B college	C college
Often	33%	29%	33%
General	43%	46%	44%
Rarely	24%	25%	23%

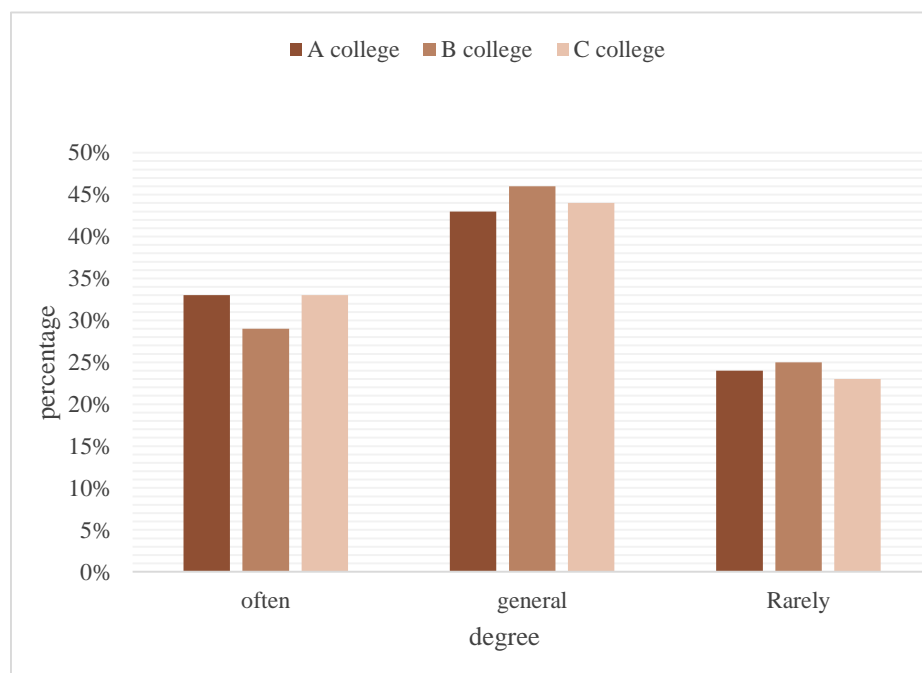


Figure 1: Whether to apply low-carbon and green concepts in architectural landscape design

It can be seen from Figure 1 that low-carbon green concepts will be applied in architectural landscape design, generally used locally, and the frequency is not very high, the frequency of use generally accounts for about 43%, but it can be seen that often there are more people who use it than seldom. It can be seen from these that the implementation of the national green concept still has a certain effect.

4.2 Application of Low-Carbon and Green Concepts in the Color Element Design of Architectural Landscape

The application of low-carbon and green concepts in the color element meter of architectural landscape design was collected through a questionnaire survey. The results of the survey are shown in Table 2:

Table 2: Application of Low-Carbon and Green Concepts in the Design of Architectural Landscape Color Elements

	A college	B college	C college
Lighting color design	42%	44%	45%
Environmental design	31%	30%	31%
other	27%	26%	24%

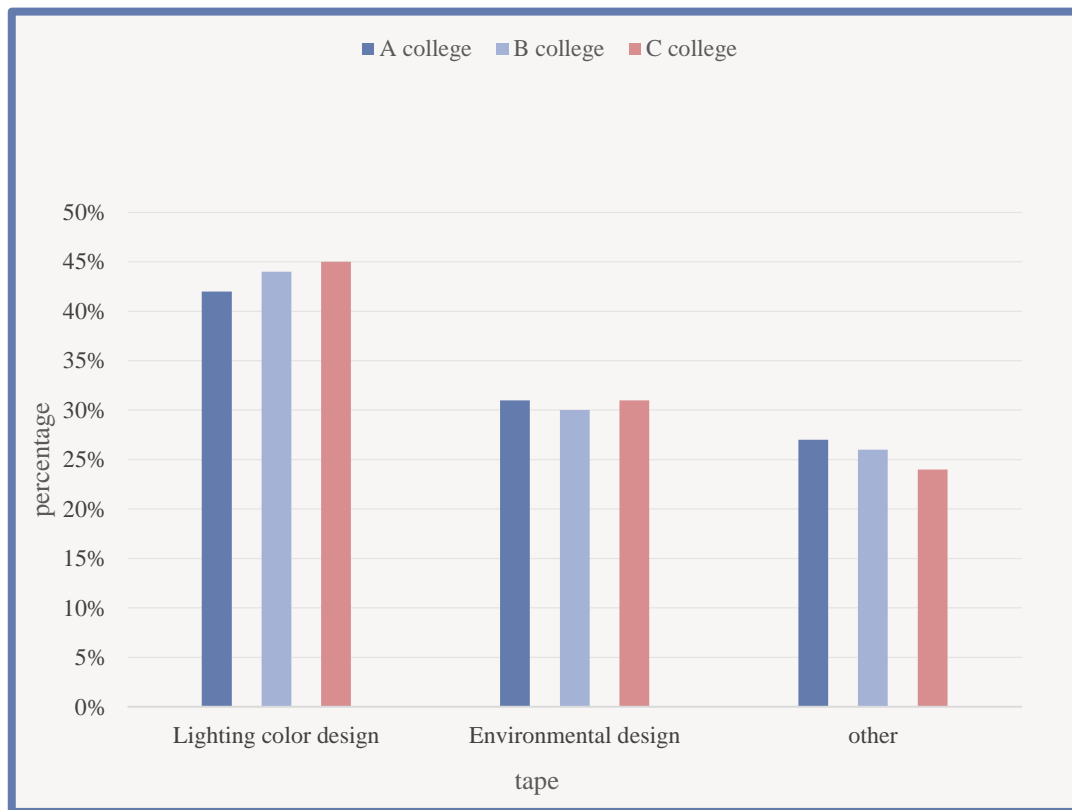


Figure 2: Application of Low-Carbon and Green Concepts in the Design of Architectural Landscape Color Elements

It can be seen from Figure 2 that the application of the low-carbon green concept in the architectural landscape design color element design is mainly the color design of lighting accounting for about 42%, and then the color design of the environment.

5. Conclusions

The application of environmental protection and green landscape design to architectural landscape design is a measure beneficial to human health. The design of landscape is to let people enjoy nature and release pressure. Therefore, it has become a very good channel for people to relax, can let the concept of green environmental protection penetrate into the hearts of the people, and is a way to show

the concept of green environmental protection in the landscape, such as using landscape illustrations, and then guiding people to apply these energy-saving results to their lives, to promote the protection of the concept of energy conservation and environmental protection.

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