The Research on the Optimization Design of Guide System of Scenic Spot Based on Environmental Protection

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Abstract. The design of the guide system is an integral part of the construction of the scenic spot, which plays a vital role in the overall visual image of the scenic spot and the visitor experience. The research on the optimization design of the guide system revolves around “environmental protection,” “sustainable development,” “people-oriented” and “close to nature.” It integrates the vibrant and colorful geographical features of the scenic spot to create an environmentally and friendly guidance system. It can meet the standards of exquisite design, distinctive features, artistic sense, and integration with the environment.

1. Introduction
After the 2009 United Nations Climate Change Conference (COP15), the issue of global climate change was highly valued, and the development of a low-carbon economy at a strategic level. The study identifies the relationship between green design and the role of green design in the development of the guide system. The green design method can be used to realize the environmental protection of the guide system, and then drive the growth of a low-carbon economy in the scenic spot.

This research is based on the design of guide system of scenic spot under the concept of sustainable development. (1) Which aims to clarify the harmonious integration of the guide system of scenic spot, and the possibility of the existence and development of the scenic guide system in the future, by analyzing the concept of sustainable development in the field of guide system of scenic spot, which includes the green and low-carbon design, reasonable placement of materials, modeling, technology, color in the design of the guide system, and the relationship between the guide system of scenic spot and the environment. (2) This research compared the guide system design of green and traditional. (3) This research gives a better understanding of the current state of technology and development based on the concept of sustainable development. (4) The research also finds out the factors that need to be considered in the design of the guide system of scenic spot and the sustainable techniques which can be adopted in, as well as the possibility of further development.

2. Theoretical Foundation / Review of the Literature
Green Design, also known as Ecological Design, this concept was first proposed by Leo Alting (1993), as he said, if the product and its production system are originally designed for environment protection, it will achieve more significant economic and technical effects. The green design is oriented to the whole life cycle of products and the basic idea is (1) to incorporate environmental factors and pollution prevention measures of product design; (2) to take environmental performance as the goal of
design and starting point of the product; (3) to minimize the impact of the product on the environment; (4) to prevent environmental pollution fundamentally; (5) to save resources and energy.

In the 1960s, American design theorist Victor Papanek first proposed that design should consider the use of limited earth resources in his book Design for the Real World. To serve the global environment, American designer McHarg studies the relationship between the guide system and nature from an ecological viewpoint in his book Design with Nature. Jayster shows a large number of the world-famous guide system of scenic spot in his book Travel Guide. While most of the literature of environmental protection-related guide system is from the network which is less.

Figure 1. The relationship among guide design, green design, guide system of scenic spot and design of guide system of scenic spot based on environmental protection

3. Research Methodology

In this study, four research methodologies are applied. (1) Provide a rich theoretical basis for in-depth research by consulting relevant books and literature. (2) Comparative study on green and traditional guide design. (3) The relevant information of the scenic spot was obtained through the on-the-spot investigation and online questionnaire survey of the scenic spot guide system. In the investigation, the existing environmental problems of the guide system were found, and then the solution was proposed, as well as the fundamental rules. (4) Through some previous research methods, a large number of data for green environmental guide design have been obtained. Also, the research further strengthen our understanding of the subject, and combine the various types of knowledge to form an innovative method to make the contribution to guide design.

4. Research Findings

It’s better to consider all stages of the process from concept design to the detailed design, which includes requirements analysis, design, production and transportation. There are eight design principles and measures which can be used in the guide design of scenic spot based on environmental protection.

(1) Respect for nature

   The most intuitive is to summarize the natural features from the three aspects, which includes shape, color and the material of the guide system. By refining the main natural morphological features of the scenic spot, such as animals, plants, mountains, geological features, specific natural colors, etc., the natural resources of rock, wood or minerals can be used as the materials.

(2) Energy saving and environmental protection

   Energy saving and environmental protection should be considered at all stages of the design of the guideline. The natural resources of the area can be analyzed, and the local natural materials can be fully utilized to reduce the environmental impact of the entire life cycle of the guide. Energy-saving and environmentally-friendly materials are recyclable, recyclable, low-energy, and easily decomposed when discarded. If there is a need to use electricity, solar power, wind power, LED can be considered.
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(3) Reduce
Under the premise of not affecting the function of the guide system, reduce its volume, material usage, and energy consumption during manufacturing and use, in the design of the guide system, to simplify the structure and interface, remove unnecessary functions.

(4) Easy to assemble
In addition to meeting the requirements of traditional usage habit in the design stage of the guide system, the assembly of the instructor is a goal of the structural design, making the connection structure of the product easy to assemble and maintain.

(5) Repeat
Repeatable means the guide system should easy to disassemble and classify, the materials and components are selected as much as possible to make the types singular and standardized, the functions are modularized, and it is easy to replace.

(6) Recycle
Reasonable recycle and reuse can have enormous social and economic benefits. The recovery performance of the guide system has a significant impact on environmental protection and resource reuse. Therefore, the characteristics of various materials should be fully understood in the design of the guidance system, including material recyclability, safety, environmental indicators and compatibility with other materials.

(7) Renew
Use recyclable materials, redesign with recycled materials, create new materials and products, new design concepts, and promote sustainable design.

(8) Sustainable
Try to avoid waste of energy or waste in the manufacturing process, control and utilize the output properly, and choosing the proper material processing method.

Figure 2. Design principles

5. Conclusion and Implications
Design of guide system of scenic spot is still at a relatively early stage of development, but with the existing scientific theories and the rich experience of some excellent scenic spots, we can apply these design principles and measures to the guide design to solve various problems. We can also integrate the scenic spots in the design process macroscopically and microscopically, show attractive natural features, and provide people with better experience services. This is the guide design that meets the needs of personal and social.
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