

# Discussion on Architectural Design based on Ecological Design

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**Abstract.** In the construction of architectural engineering, architectural design is very important and plays a key role in the completion of the whole building. With the awareness of environmental protection deeply rooted in the hearts of the people, people attach importance to the design concept of integrating ecological architecture into architectural design. Nowadays, people not only pay attention to the practicality of architectural design but also pay more attention to environmental problems. The concept of ecological architecture has been integrated into the current architectural design and has become a new trend of architectural design development. Based on this, this paper further discusses the practical application of ecological architecture concepts in architectural design.

**Keywords:** Practice; Ecological architecture view; Application; Architectural design.

## 1. Introduction

With the rapid development of China's social economy, China's infrastructure industry has also grown up with it. Nowadays, the construction industry has become an important part of China's economy. The traditional way of development and utilization of resources will cause serious consequences of environmental pollution, resource depletion, and ecological deterioration. Therefore, we should actively explore the application of ecological architecture concepts in architectural design, promote the development of a low-carbon economy, and maximize natural resources to architectural design. The idea of sustainable development will be applied to architectural design activities, not only to protect the quality of the ecological environment but also to meet the needs of the combination of energy conservation and architectural design. [1]

Under the reasonable conditions of reasonable economic constraints, safety, beauty, and other conditions, construction projects should also fully meet the needs of the development of the market economy and the rising living standards of residents. the supply of building materials and construction technology also need to be continuously strengthened. The economy referred to here is not only the construction investment of the building, but also whether the investment in the construction process is scientific and reasonable, but also related to whether the building brings long-term negative development to the natural environment. This process is a long-term consideration, so saving investment in the construction process does not mean economy, nor can it be fully considered that it is uneconomical to invest a large amount of money in construction projects to ensure that the building does not have any negative impact on the surrounding environment.

Ecological architecture is a relatively complex system engineering, so it is very difficult to establish a complete design scheme of ecological architecture. Since it is an ecological building, it must have the following three basic characteristics: economic benefits and respect for nature. Respect science. In the process of ecological architecture, high efficiency always runs through the whole process, including design, material selection, operation and the end of the life of the building. Ecological architecture is mainly designed to meet the subjective needs of human beings in a natural and non-mechanical way, to make it comfortable and satisfied.

## 2. A Brief Introduction to the Concept of Ecological Architecture

The so-called concept of ecological architecture refers to the combination of ecological environment and architectural design, integrating the concept of the ecological environment into the

actual architectural design, to achieve a balanced circular relationship between architecture and ecology. That is to say, the relevant architectural design is carried out on the premise of environmental protection in the actual architectural design. Reduce energy consumption by maximizing the use of natural resources [1]. In addition to natural resources, it is also necessary to explore the interior design of buildings, the specific shape, and orientation of buildings, to achieve the purpose of coordination with the natural environment. To design a comfortable and environmentally friendly building.

### **3. Discussion on the Practical Application of Ecological Architecture Concept in Architectural Design**

#### **3.1 Evaluate the Function of Ecological Environment before Development and Construction**

In the construction industry, how to make full use of the concept of eco-environmental protection architecture into building planning, design, construction, put into use and other links, under the guidance of ecological architecture concept to complete a low-carbon, environmental protection standards and requirements of the building. As can be seen from the traditional architecture, architectural design staff often ignore the environmental factors around the building, which makes the building incompatible with the environment, and does not meet the requirements of low-carbon and environmental protection. Therefore, under the guidance of the concept of ecological architecture, the new architectural design should pay attention to environmental problems. In addition to paying attention to the design of the building itself, it is also necessary to take into account the surrounding natural environmental factors and correctly deal with the relationship between environment and architecture. So that the two can be integrated. Also, it is necessary to make full use of the advantages of topography and natural environment to reduce energy consumption in construction projects. To integrate the concept of ecological architecture into the actual architectural design, it is necessary to evaluate the function of the ecological environment before architectural design, especially on land, grassland and water resources. minimize the waste of cultivated land resources, the destruction of grassland and the pollution of water resources [2]. The construction wastes generated in the course of construction must be properly disposed of to avoid pollution of land and water resources. In addition to the above situation, the surrounding architectural features and landscape should also be integrated into the design, so that it can be effectively combined with the design. That is, to complete the architectural design under the principle of protecting the ecological environment. Through the ecological civilization concept of respecting, conforming to and protecting nature, architectural design can make architecture and the ecological environment coexist harmoniously, and finally realize the unity of economic, social and ecological benefits.

#### **3.2 Rational use of Building Space**

As land resources are limited, the utilization of land resources should be taken into account in architectural design. First of all, it is necessary to clarify the use and demand of buildings and make full use of land resources and rational layout on the premise of ensuring that the use of buildings meets the needs. It includes the layout of the whole building and the layout of sub-buildings to maximize the use of land resources. In the process of architectural design, the functional change of the building should be fully taken into account. Due to the long service life of the building, there is a high probability of functional change in the actual use process. The change of building function can make the utilization of buildings reach a virtuous circle. Therefore, the design staff should pay attention to the flexibility and variability of the building space, avoid the collapse and reconstruction of the building, and maximize the utilization rate of the building in the life cycle. [2]

### **3.3 Ecological Indoor Design**

Compared with the traditional interior design, the interior design under the guidance of ecological architecture theory has more advantages, and the design concept can further meet the requirements of environmentally sustainable development. Therefore, the interior design based on the concept of ecological architecture needs to fully consider the problems of resources and energy consumption, mainly from the aspects of energy conservation, resources, practicality and so on, to avoid design drawbacks. At the same time, reduce the number of decorative materials, plan the cost of decoration. In the whole interior design, designers need to pay more attention to whether the materials can be recycled after use. for example, when designing furniture, to extend its service life, the selected materials are mainly healthy, pollution-free, green and other materials. such as wood, stone, silk wool and other pure natural interior decoration materials, compared with the materials used after chemical synthesis, It has the advantages of environmental protection, non-toxicity and the ability to adjust the indoor environment. In the aspects of indoor ventilation, daylighting and noise treatment, we can choose natural resources and make full use of natural lighting to broaden the indoor space accordingly. In the design of ventilation, fully consider the environment near the building, such as the application of solar energy, easy to design bath and so on. At the same time, make full use of green design technology, for example, effectively apply the characteristics of plant waste gas absorption to remove carbon dioxide, formaldehyde and other gases in the indoor air, to provide residents with a comfortable and good air environment. And put the plant indoors, can also play a certain decorative role, which can be extended to the entire indoor greening facilities, balcony, courtyard, and other space design. [3]

### **3.4 In Terms of Building Scheme**

In the process of construction, the coordination between the building itself and the surrounding environment must be taken into account, even if the architectural designer himself has some characteristics and ideas in the process of considering the architectural design plan, but while imposing individual plans on the architectural design, it is also necessary to carefully consider the coordination between the building and the surrounding building environment and the sharing with the surrounding buildings. Coordinate the design style from the whole cultural environment, urban development environment and the mainline of urban architecture, to contribute to the development of the city. [4]

In the process of architectural design, the coordination between the aesthetic feeling of the building itself and economic conditions should be fully taken into account. The economic investment in construction needs to be as scientific and reasonable as possible, to fully meet the needs and functions of the investors, meet the design ideas sought by the architects themselves, and reduce the economic investment under these conditions. only in this way can we be regarded as a good ecological architectural design, but we can not reduce the economy excessively, and the substandard construction quality is likely to be brought about by squeezing the cost too much. Therefore, the construction plan must satisfy both investors and designers as far as possible. [5]

In the process of architectural design, it is necessary to run through the ecological concept of sustainable development. Although the social economy of our country is developing rapidly, the acceleration of development brings about the continuous reduction of material resources, and the growing economy also has a higher demand for material resources. therefore, it is urgent to maintain the architectural concept of sustainable development in the process of architectural design. An architectural work with a good design contains not only the creativity and ideas of the architect but also the opinions of various construction experts and environmental protection experts in the process of construction. these experts can formulate the structure of the building and improve these links using lighting, ventilation, daylighting and so on. in the process of development, the architecture includes the progress of the architect's ideas. Integrate and implement these improvements into the design and details of the construction.

## 4. Conclusion

The current environment not only carries our living needs but also meets the needs we constantly ask for. Natural resources are limited. We must protect natural resources with a good ecological cycle. Otherwise, it will affect the needs of future generations. Only by establishing an ecological building environment and forming a virtuous circle are the real development of society and the embodiment of human progress. Establishing the ecological environment scientifically and reasonably is also a sign of social harmony. Only in this way can we human beings have a better tomorrow. The application of ecological architecture concept in architectural design pointed out in this paper is not only reflected in materials, sites, and energy but also reflects the comfort of living. It has a certain guiding role for the later construction.

## References

- [1]. Tang Junwei. Analysis of the key points of green design in architectural design [J]. Engineering Construction and Design, 2018 (20): 49-50.
- [2]. He Zhiwei. Discussion on the application of green building design concept in architectural design [J]. Housing and Real Estate, 2016 (21): 72.
- [3]. Zhou Yi. Research on the design strategy of old-age building based on green building concept [J]. Urban Development Research, 2016, 23 (05): 12-14 + 19.