

# Analysis and Research on the Application of Green Building Design Concept in Architectural Design

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**ABSTRACT.** *This article starts with the analysis of green building and green design concept, and elaborates in detail the meaning of green building and green design concept. Then, the design principles of green buildings are analyzed in detail, and the advantages of the design concepts of green buildings are elaborated in detail, including two parts: effectively reducing the energy consumption in the process of building use and transportation and being beneficial to the physical and mental health of the residents. And then this paper analyzes the existing problems in green building and their solutions, including effectively improving the comprehensive index of green building design, strengthening the supervision and management of green building construction process and further improving the design theory of green building. Finally, the concrete expression of the green building design concept is analyzed, including three aspects: strengthening the green concept of the building structure, selecting the raw materials with good performance and improving the related building technology. It is hoped that relevant people in the building industry will attach importance to the concept of green building design in building design and promote the sustainable development of the building industry.*

**KEYWORDS:** *Architectural design; Green building; Design concept*

At the present stage, science and technology information technology is continuously developing and occupies an important position in all sectors of society. New technologies and new construction methods are widely used in construction-related industries. The application of green design in architectural design can protect the environment, save resources and be more environmentally friendly. Driven by the rapid development of the construction industry, the cost of construction is also relatively high. The concept of green building design can effectively reduce the cost in the process of construction and at the same time can effectively improve the utilization rate of land.

## **1. Green Building and Green Design Concept**

### ***1.1 The meaning of green building***

In a certain building, or in the whole process of construction and production of the building, the building materials used are environment-friendly and pollution-free, and the pollution to the environment needs to be reduced to the greatest extent. This kind of building is called a green building. Nowadays, construction-related industries pay more attention to the concept of green building, and the concept of green and healthy human life is also reflected in the design and construction of green buildings. Green building design concept can embody people's healthy and green life concept in building construction, which is conducive to the sustainable development of the construction industry and can create a harmonious environment between nature and human beings. Green building design can also be conducive to resource regeneration and environmental protection.

### ***1.2 Green design concept***

Green building design concept is widely promoted in the construction industry. Nature, as the foundation of green building design concept, its development strategy is to promote the harmonious development of human beings and natural environment, and at the same time to truly realize energy conservation and emission reduction. As far as the current building situation in our country is concerned, more natural resources, human resources and material resources are needed in the process of building construction, and more energy will be consumed in the whole process, which has played a negative role in the realization of the sustainable development of the city. Only by carrying out the design concept of green building in the construction related industries and paying attention to the effective realization of the concept of green building in the whole process can the related projects in the construction industry be combined with healthy and green ecological environment protection, and can the harmonious coexistence between human beings and nature, building and nature be ensured, which is conducive to the sustainable development of green building design.

## **2. Principle of Green Building Design**

In the process of designing green buildings in construction-related industries, we must adhere to the principles of paying attention to new energy, putting people first and energy conservation and environmental protection. The concept of green design requires relevant personnel to select more environmentally friendly design raw materials in the design and construction process. In the construction process, they also need to ensure that the design process must fully meet the relevant requirements of environmental protection. In the process of architectural design and construction, they need to pay attention to the strengthening of construction environment renovation, so as to ensure the overall effect of architectural environment design. In

the process of building design and construction, relevant designers and construction workers need to pay attention to the protection of the ecological environment and try to avoid the environmental pollution caused by the destruction of the ecological environment due to improper construction and the selection of wrong raw materials. In the construction process of green building design, it is also one of the principles to choose green and energy-saving building raw materials, which can not only effectively improve the efficiency of building construction, but also improve the utilization rate of energy. It is for this reason that the effect of green environmental protection concept in building construction is better.

### **3. Advantages of Green Building Design Concept**

#### ***3.1 Effectively reduce the energy consumption in the process of building use and transportation***

In the design and construction process of buildings, the selection of construction raw materials is particularly important. The concept of green building design requires the selection of construction raw materials to ensure green environmental protection, which can reduce the energy consumption in the process of building use and transportation. Managers in the construction industry need to supervise the transportation and use of raw materials, develop problems in the transportation and construction process in a timely manner, and optimize them. In building design and construction, the concept of green building design requires relevant personnel to adopt the principle of proximity when transporting raw materials in order to reduce transportation costs and save fuel consumption during transportation.

#### ***3.2 It is beneficial to the physical and mental health of the residents.***

In the process of architectural design and construction, the research and development and use of new energy materials can reduce the waste of natural resources and enable the rational use of natural resources, which is conducive to maintaining the ecological balance between human beings and nature. In the design and selection of building materials, in order to ensure sustainable development, more attention should be paid to the harmonious coexistence between human beings and nature. In order to meet the concept of green design in the construction process, it is necessary to reduce the use of harmful new chemical substances in the construction process, to avoid the impact of harmful chemical substances on people's health and ecological environment, and to effectively reduce the waste of resources and environmental pollution. The sustainable development of building construction needs the support of the concept of green environmental protection. The materials used in the process of building construction must be environment-friendly and harmless to people's bodies. At the same time, the use of wood raw materials in buildings should be minimized. The implementation of the concept of green building in building construction is conducive to ensuring the physical and mental health of building users.

#### **4. Problems and Solutions of Green Building at present**

##### ***4.1 Effective improvement of comprehensive indexes of green building design***

In the process of architectural design and construction, the concept of green should be fully integrated. In the process of architectural design, designers need to pay attention to the design process and ensure green environmental protection. The raw materials for construction also need to select environmental protection materials. Our country's construction-related industries need to apply modern and advanced construction technology to design and construct buildings according to different regional environments and audience needs. In the design of green buildings, attention should be paid to the continuous improvement of comprehensive design indexes, the standard of rational utilization of hydroelectric resource and ground standards (including indoor and outdoor) in architectural design and construction, etc. Only by strictly implementing and formulating relevant standards in the design and construction of green buildings can the concept of green buildings form a reasonable and scientific system capable of long-term development, which can also be conducive to the sustainable development of building design and construction, to the progress and good development of the building industry, and to the effective improvement of the comprehensive indicators of green building design.

##### ***4.2 Strengthen the supervision and management of the construction process of green construction***

In China's current construction industry, the supervision and management of the design process and construction process of green buildings are not enough. In order to make the building meet the standard requirements when it is completed, relevant management departments and construction units need to perfect the construction operation procedures. In the process of architectural design and construction, it is necessary to ensure that the whole process can conform to the concept of green building. Relevant management personnel of construction units need to supervise the whole process of design and construction, pay more attention to the research and development of new technologies and new products, and pay more attention to the quality of selected raw materials. Only in this way can the construction of green buildings be completed and the quality of completed buildings be guaranteed.

##### ***4.3 Further perfecting the design theory of green building***

At present, the concept of green building has been paid attention to by relevant personnel in our country's building related industries, but the theory of green building design is not perfect enough. In order to implement the concept of green building, relevant building staff must attach importance to targeted building design. They need to carry out relevant green building design according to the use scope and different functions of different buildings. The premise is to effectively save the cost

of buildings, protect the ecological environment and ensure the sustainable development of green building design and construction. In different links of architectural design and construction, it is necessary to effectively reduce the loss of resources and reduce the production cost as much as possible. During the implementation of the green building design scheme, in order to further optimize the building technology, the role of modern science and technology needs to be brought into full play.

## **5. Concrete Expression of Green Building Design Concept**

### ***5.1 Strengthen the green concept of building structure***

At present, the structure of buildings in our country is generally divided into two forms, including single-storey buildings and multi-storey buildings. The application of green design concept in the process of architectural design and construction will change the structure of traditional buildings and further optimize the structure of buildings. For example, when designing the building structure of the house where the audience lives in the construction project, the designers first need to consider how to make the structure of the house be effectively utilized, and then need to consider how to ensure the lighting of the room and what kind of green and environmentally friendly materials to use for construction, so as to meet the relevant requirements of green buildings and realize the green concept of the building structure.

### ***5.2 Select good raw materials for production***

In the process of building design and construction, the production raw materials with good performance are selected, and then the production technology is continuously reformed and updated, so that the building can conform to the design concept of green and environmental protection. With the rapid development of science and technology, researchers have gradually developed more environment-friendly materials for building construction. At the same time, they have been widely used in building design and construction, which enables modern buildings to meet the needs of green design concepts and residents and users.

### ***5.3 Improve the relevant building technology***

The concept of green building has been widely recognized by relevant practitioners in the building industry. Building design and construction units are also constantly optimizing and improving their own building technologies in order to be widely recognized by the audience and meet the relevant requirements of green building design. Construction-related enterprises need to improve their own construction technology and constantly innovate. Only in this way can the quality of buildings reach the acceptance standard, the concept of green building design can be

realized, the cost of building design and construction can be effectively reduced, and the sustainable development of green buildings can be ensured.

## 6. Conclusion

The progress of science and technology has brought new energy materials into people's vision. New energy materials have been widely used in all walks of life. Modern people pay more attention to the concept of green environmental protection. In the related industries of architectural design, the architectural concept of realizing green and sustainable development has been paid attention by relevant people. The concept of green building design has played a role in protecting the biosphere and ecological environment where people live, can reduce the damage to the existing resources on the earth, and is conducive to the harmonious coexistence of human beings and the natural environment.

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