Application of Green Building Design Concept in Architectural Design

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Abstract: With the continuous improvement of China's economic level, the construction industry is also developing. In order to meet the development needs of the current era, the construction industry needs to be able to actively integrate green concepts, improve people's quality of life, and promote better social development. This paper first understands the application principles of green concept in architectural design, and then analyzes the specific application of green concept in architectural design to provide reference for relevant researchers.

Keywords: Green Concept; Architectural Design; Apply.

1. Introduction

In the current era, the process of urbanization is accelerating, and the scale of construction is gradually increasing. As a result, the amount of energy and resources consumed by construction projects is also increasing. Green building and energy-saving design came into being, to a large extent, can effectively reduce energy consumption, alleviate energy shortages, and avoid major bottlenecks in the process of urban development. At the same time, these measures also help to provide a healthier, safer and more comfortable living environment and activity places for the general public, which is conducive to the harmonious coexistence of buildings and natural environments.

2. Green Building Design Concept Related Overview

After the introduction of energy conservation and emission reduction policies in China, production in various fields began to pay attention to their own energy conservation and emission reduction effects. Through the process of energy conservation and emission reduction, energy conservation can be achieved and environmental pollution can be reduced while reducing emissions. In order to promote the development of green buildings, the construction industry has integrated energy conservation and emission reduction into its development process. Green building refers to the integration of the concept of "green environmental protection, energy conservation and emission reduction" in the construction process, and make effective progress in improving and transforming the aspects of high energy consumption and greater environmental impact, in order to minimize the use of various energy and pollutant emissions to meet the requirements, and reduce the impact on the surrounding environment; Green building design is based on strict compliance with the design requirements, environmental protection and saving in each stage of the design concept, to ensure that energy conservation and emission reduction requirements, so as to promote the building with environmental protection and energy saving effects.

3. Green Building Design to Follow the Basic Principles

3.1. Affinity With Nature, People-Oriented Principle

Green building design must follow the principle of people-oriented and close to nature, and build a green ecological community that integrates and optimizes people, architecture and nature. Its goal is to create a living environment with good air quality, suitable humidity, good lighting and ventilation, and comfortable audio-visual environment on the basis of people-oriented. In the design process, we should fully consider the needs of human on the building and the impact on the surrounding environment, which provides a good prospect for the sustainable development of green buildings.

3.2. Energy Saving and Emission Reduction, The Principle of Optimizing the Environment

In the design of green buildings, it is necessary to minimize the dependence on non-renewable resources and energy, increase the use of natural clean energy such as solar energy, wind energy, water energy, biological energy, and further improve the thermal energy conversion efficiency of building materials. At the same time, it can realize the functions of building heat insulation, sound insulation and sun protection, and expand the application of recyclable green building materials. In addition, it is also necessary to minimize the adverse impact of pollutants such as dust, noise, harmful gases and radiation generated during construction on the natural ecological environment to achieve the best environment-ecological effect.

3.3. Advanced Intelligence, The Principle of Sustainable Development

With the continuous development of science and technology, automatic control of information has been deeply involved in human production and life. The organic integration of high-tech wisdom and green ecology greatly improves the comfort, safety and convenience of living. At the same time, green building design needs to consider the current use and future benefit sharing, to achieve the organic
unity of short-term planning and long-term expansion, which is a sustainable design method.

4. Application of Green Building Design Concept in Architectural Design

4.1. Realize the Rational Use of Resources

In the architectural design, we must consider the overall design effect, and scientific and meticulous rational use of various resources, in order to improve the utilization rate of resources, reduce the waste of social resources. First of all, in modern architectural design, wind resource is one of the most important resources, so designers need to ensure the reasonable design of building structure, orientation and shape, so that the building has a good windward side. At the same time, local climate factors should be fully considered, and wind energy should be actively introduced to generate electricity and heat to improve the efficiency of green energy utilization. Secondly, solar energy, as a renewable and green energy source, should be fully utilized and integrated with the local natural environment. Finally, renewable resources should be integrated into the green building design and improve their utilization rate and scope of use, so as to achieve the goal of improving the utilization rate of renewable resources.

4.2. Actively Promote the Use of Environmentally Friendly Materials

In architectural design, designers should choose environmentally friendly building materials with low pollution and high utilization to ensure building quality, improve residential comfort and safety, and reduce the impact on the environment. For example, aluminum silicate insulation with excellent water resistance and flame retardant properties can be used, which has less loss and can absorb excessive heat, reducing the risk of fire while insulating. Promoting the harmonious development of man and nature is one of the main directions of the development of the green building industry, and achieving sustainable development. In order to fully implement the concept of green building design, environmental pollution must be reduced to a minimum, and high-quality environmentally friendly building materials must be selected. The use of this green building material can not only ensure the quality of construction, but also improve the comfort and safety of living, and reduce the pollution caused to the environment.

4.3. Make Full Use of Renewable Energy

In the whole life cycle of the building, people's production and life will produce huge energy consumption; On this basis, the concept of energy saving and consumption reduction is put forward. Therefore, while saving energy, we should also use new renewable energy sources as much as possible to replace traditional energy sources[2]. Wind, solar and geothermal energy are renewable resources that can be used efficiently.

We can carry out scientific planning and design according to the climatic conditions of the site and the necessary technical means. For example, solar energy can be used to provide some auxiliary electricity for buildings; Through reasonable layout, it can realize full sunshine to save lighting power, and use natural ventilation to save air conditioning energy; Can use water source heat pump, buried pipe, etc., save air conditioning power; New energy-saving insulation materials can be applied to improve the thermal insulation performance of the external envelope of the building, saving the energy consumption of cooling in summer and heating in winter; Rainwater can also be collected and used to irrigate plants in the park, save water and so on. On the one hand, we should adopt a variety of energy-saving measures to reduce energy consumption. On the other hand, we must fully explore and utilize new energy sources and continue to improve the efficiency of renewable energy.

4.4. New Materials Combined with Green Elements

Since human society entered the high-tech era, related industries driven by scientific and technological innovation have developed rapidly. The wide application of new materials has injected new vitality into architectural design, and various high-tech materials are gradually replacing traditional wood, brick and other raw materials. With these new materials, we can see many imaginative and creative green concepts come to fruition. For example, "roof garden", as a classic case of integrating green concepts into architectural design, covers the top of the building with a layer of high-quality waterproof isolation material, and plants a certain number of plants, which can not only achieve green effects, but also has the functions of purifying the air, thermal insulation and beautifying the environment.

4.5. Achieve Efficient Water Recycling

Water-saving technology is also an important green building technology to realize green building design. On the one hand, enterprises can effectively use rainwater, steam and other water resources through rainwater purification devices, and use the treated rainwater and steam water for building plant irrigation. When irrigating plants, more water-saving methods such as micro-irrigation and drip irrigation can be used. On the other hand, it is also necessary to establish a building water network system and build an automatic water-saving control system, so that the water resources in the building can be used efficiently and reasonably[2].

5. The Way to Combine Green Building Technology and Building Design Optimization

5.1. The Combination of Green Building Technology and Building Design Technology is Realized in the Planning Stage

In the planning stage of green buildings, first of all, relevant personnel need to conduct detailed exploration of the geographical characteristics and environment of the building site to fully understand the climate, surrounding environment, spatial location and other characteristics of the building site. Secondly, computer technology needs to be used to design the building based on the information obtained from the preliminary exploration[1]. In the process of design, it is necessary to pay attention to the optimization and adjustment of the layout of the building's orientation, wind energy, solar energy, and so on. At the same time, it is also necessary to simulate the lighting effect of the building to ensure that the building has good lighting conditions. Finally, it is necessary to design the indoor and outdoor space of the building to
enhance the effect of the drafts of the building, so as to achieve the purpose of good ventilation.

5.2. The Architectural Design ADAPTS to the Climatic Characteristics of the Building Site

In architectural design, it is necessary to adapt to the climate characteristics of the building site. According to the climate characteristics of the building site, the targeted design of the building structure, building materials and space layout has become one of the most important factors in architectural design. Therefore, in the early stage of design, relevant personnel need to fully investigate and understand the climatic conditions, cultural conditions and surrounding environment of the building site, so as to design a building that can meet the safety and comfort requirements of residents inside the building, and meet the local humanistic characteristics and local aesthetic concepts in terms of the appearance of the building. Ensure that the design meets all the housing needs of the residents as far as possible.

5.3. Combine Building Energy Saving Design and Form Design

Green building design is different from traditional architectural design, which is based on blueprints after exploring the surrounding environment of the building site. Therefore, in most cases, the design is sentimental and does not fully take into account the living needs of the building. The design of green building is to use computer technology to simulate and quantitatively analyze the design of the building, and use computer models to simulate and analyze the resource consumption and cost in the building design, so as to achieve the purpose of beautiful appearance and reduce energy consumption[1].

6. Conclusion

In short, with the continuous development of our country construction industry, our country construction industry will be green and sustainable development. In this process, the architectural designer should determine the design points under the green concept, take the initiative to choose the green materials suitable for it, and create a green construction environment from the whole building, to better improve the energy consumption of the building, achieve effective protection of the environment, and create a comfortable and environmentally friendly living conditions for the people. Promote the construction of our country to move forward, make their own contributions to social construction, and achieve the best development results.

References