

Application of Green Building Ideas in Design

Yu Xiaozong*

ChongQing Communication Design Institute Co,LTD ,Chong Qing, 400041,China

Abstract: With the deterioration in living environment and development in spiritual civilization, green building has been promoted and applied. Facing with the gradually increasing quality of life, public have made many demands on the living environment and indoor environment has been paid more and more attention. In order to better promote the green building concept, in addition to do in-depth research on ecological technology, considerations from many areas such as environment, demand, energy saving, and etc. have to be taken, so as to better achieve the green building design. In this paper, based on an overview of green building design, analysis of the application of green building ideas in design has been done, hoping to provide some references to relevant staff.

Keywords: Green building; Design idea; Application

1. Summary of green building design

Green building is a structure and the using of processes that save resources, reduce pollution, and protect the environment to the greatest extent throughout a building's life cycle, so as to provide people with practical, healthy and high efficiency space, as well as living in harmony with the nature. Green building pursuit the harmonious development between man and nature, so that the construction technology and engineering, bionic, and the nature can be combined. Through the construction of green building that is conducive to development, and ensure the balance in ecology, make up the lacking of the nature by artificial means, and finally design an ecological construction that integrates beauty and nature.

2. Principles of green building design

2.1. People oriented

People are the backbone of social development. Architectural design is mainly to provide mankind with a better living space. Thus, in real life, people oriented work ethic must bring into play, with the combination of human development needs, to reject the use of harmful materials. Therefore, in building design, environmental balance shall be seeking, harmony between nature and artifact can be achieved only if they are unified.

2.2. Environmental protection, energy conservation

Construction works have a great impact on the surrounding water source, topography, and plants, so survey has to be carried out on the surrounding environment prior to construction works, to reduce the impact on the surrounding

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Corresponding Author: Yu Xiaozong, E-mail: 409181814@qq.com.

environment, particularly waste water and waste gas pollution. The construction industry as a high energy consuming industry, if the energy is not fully utilized, it may result in a waste of resources. Therefore, in the application of green concept, energy saving shall be applied to every aspect. In designing, plan with less energy consumption shall be selected, improve the material application rate, and ensure new technologies are applied, i.e. through greenhouse effect, waste heat recovery and other technologies, to obtain sustainable energy.

2.3. High efficiency economic

In building design and construction, materials that are favorable to the construction shall be used based on the actual situation but not blindly used. Based on the principles of consumer sciences, appropriate and flexible approach to improve the effectiveness building design fundamentally.

3. Application of green building ideas in design

3.1. Rational planning of building land

Rational planning of every inch of land is one of the basic national policies in China. Rational use of land is taken seriously by the country and people. Land resources is limited in China, therefore, land resources have to be protected, developed wisely and used realistically, to reduce the waste of land resources. For the building land in country's necessary construction or rural construction, a fully rational layout shall be planned, and adhere to implement the idea of land conservation. In choosing construction land, if it is possible, shall make full use of badlands and slope, and do not or take up less of agricultural land. In terms of building design, it is the rational scientific design and transformation of high rise building, improve the utilization rate of building volume, utilize the underground space efficiently and increase the city capacity. During land designing, green building design requires maximum enhancement in land use, and improve the concentration of residential land. In urban and rural construction areas, the use of build area shall be enhanced according to local conditions; during land planning, protection of the natural environment shall be focused, so the building coordinates with the natural environment.

3.2. Application of green building design in construction aspects

3.3. Application on the design of building facing direction

The facing direction of a building is directly related to the receiving of sunlight, air flow volume and other aspects, so the facing direction design must be done properly. During the green building design process, the designer shall carry out survey on the directions of the area, degree of sunlight radiation, coordinates and other conditions, combined with the results of the survey data to determine the orientation designing plan of the building. For example, in a city with relatively low temperature, the design needs to take into account the aspects like lighting and area of windows.

3.3.1. Building shapes and graphic design arrangement

Currently there have been many different shapes of building which give people a different kind of visual experience. During the process of carrying out the building shape design, the designer must take into account the overall heat dissipation ratio, because the larger the outer surface area, the faster the heat dissipated. Thus, the designer shall give all rounded consideration on both the overall building structure and its purposes when doing the building exterior design. For example, in the design of elevator, west or south shall be chosen as this can reduce direct sunlight to extend the service life of the elevator. In addition, setting up an open air atrium can offer good ventilation.

3.3.2. Greening of the surrounding of rational design building

Building greening is an important manifestation of the harmonious development between man and nature. Rational greening design will not only give pleasure but also able to purify the air in your area.

3.4. In the aspect of building structures design

The energy consumption of the facade of a building is about $\frac{1}{4}$ of the energy consumption of the overall building. Thus, for the design of the external walls of the building, the area of the external walls should be minimized. According to mathematic knowledge and architectural theory, the outer shape of a building should be round or oval, to reduce the

outer surface area of the building and the appearance of the building will not be too complicated, which truly achieve the energy saving purposes.

Now that the building floor is relatively high, so the effect of wind is relatively large, and this will cause energy loss to buildings, especially in the areas with relatively low temperature during winter. The heat energy on the building surface will be taken away if the wind is too strong. Therefore, the building ventilation design and natural environmental design must be combined with the local geographical and climatic conditions, to design a rational, scientific and environmental friendly building.

For balcony design in green building design, more often protruded type balcony will be chosen because this design not only can increase the area of the building, while also can form a shading area for the building. This design can save energy efficiently, and at the same time play a certain role in balancing the building ecosystem, the effect is significant.

The green design of windows is critical to a building design. Because glass windows have relatively high heat transfer, it will produce cold radiation to human body, and also have a greater impact towards the indoor temperature, which would largely reduce the comfort level of the indoor environment. For this problem, while designing building windows, designer shall take into account the following points: ① the size of the window area shall be reasonably designed to ensure that the solar radiation energy is larger than heat loss, thereby reducing the energy consumption situation. ②Improve the airtightness of windows, try to block the cold air from entering indoor, choose reasonable window materials, reasonable design of window structures, strengthen the insulation properties of the windows, and then reduce the heat loss caused by windows.

Conclusion

Overall, since the Chinese economic reform, modern architecture is widely loved by the public. Since building is an energy consumption work, it will cause greater pollution to the environment. Therefore, greening is promoted in building design, in order to improve the living environment and living standard, to reduce resources burden. From the point of view of reserves, many resources are non-renewable. Facing the resources depletion, what human beings can do is to save resources, fully utilize renewable resources, reduce the adverse effects of construction work towards the surrounding environment, so that green building design can exert greater benefit.

Reference

1. Liang Bin. Research on the sustainable thinking of strain design strategies of cold region architecture [D]. Harbin Institute of Technology, 2015.
2. Han Xutong. Research on the application of green decoration materials in hotel design [D]. Jilin University of Architecture, 2015.
3. Ren Ying. Research on the application of green building design method in hospital.
4. Jiang Ying, Zhang Hanyu. Application of green building design concepts in design [J]. Business Story, 2015, 23:20.