

Exploring the Research of Green Residential Interior Design under the Concept of Low Carbon

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ABSTRACT

With the development of scientific and technological progress and the gradual improvement of national living standards, people are paying more attention to the green and low-carbon design of residences, seeking a more comfortable living environment. The article explores ways to integrate low-carbon concepts into residential interior design from the perspectives of spatial design, decorative design, and energy application, which can help to promote ecosystem balance, minimise resource wastage, and promote the sustainable development of the construction industry while improving the level of design.

1. Introduction

With the booming development of economy and society and modern technology, the quality of life of nationals has been greatly improved, and the low-carbon concept of interior design has been continuously updated. If we want to meet the living requirements of the majority of nationals, we should integrate the concept of low carbon and environmental protection into the interior design of residential buildings, so as to not only meet the basic functional requirements of residential buildings, but also reduce the

carbon emissions and energy consumption of buildings and interiors, in order to meet the living standards of the occupants, and to provide them with a high-quality living and living environment. Low-carbon architectural design means making man and nature reach a relatively stable, balanced and harmonious state. Nowadays, low carbon has become an important standard for interior design. The study of residential interior design based on the low-carbon concept is necessary for the development of low-carbon design and the popularisation of its concept.

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2. Low carbon concept and residential interior design

With the rapid expansion and massive construction of our cities and towns, our natural resources are decreasing, and the balance between man and nature is broken. Entering the new period, green, low-carbon has become an important concept of residential design, and housing designed based on the low-carbon concept is more recognised by users. At present, China's building decoration industry is in a new stage of development. Therefore, people engaged in interior decoration work should be fully integrated into the entire functional development, fully aware of the characteristics of the times, and promote the development of architectural decoration industry to a new height. Currently China's residential interior design there are many problems, mainly in the lack of high-level, strong sense of responsibility of professional designers, professional development is lagging behind. Some interior designers' thinking is stagnant, and it is difficult to accept novel ideas and thoughts. In addition, in order to earn higher profits, some construction workers choose poor quality building materials, which is against the original intention and work ethics of architectural design and construction. At the same time, this behaviour is contrary to the concept of low-carbon environmental protection, which in a sense increases energy consumption and causes great damage to the environment, thus breaking the ecological balance. With the improvement of material living standards, more and more people are beginning to pay attention to spiritual needs, and they are wasteful in interior decoration, choosing luxurious materials. Some people pay too much attention to the artistry of space and the beautification of the interior environment, resulting in a huge waste of resources. In the interior decoration of houses, energy consumption should be minimised to prevent waste of resources, which is in line with the concept of low carbon and environmental protection. Some of the materials used in the interior decoration may cause some harm to the health of the residents, for example, the emission of chemical gases will have a great negative impact on the lives of the residents.

3. Residential interior design status quo

3.1 Neglecting the selection of low-carbon materials

To analyse high-quality decoration materials from the perspective of design, the designer's knowledge of materials will have an important impact on the decoration effect. Considering the current technical level, products with lower energy consumption and higher quality should be

selected so as to further improve the design quality on the basis of quality assurance. In residential design, energy conservation must be fully realised in order to achieve the best results.

However, most construction companies will choose cheaper building materials to quickly shorten the construction period, ignoring the quality of raw materials so as to improve their own economic efficiency. And environmentally friendly decoration materials unit cost is higher, a large number of environmentally friendly materials will cause the decoration cost is too high, which is also some construction companies in the selection of raw materials to ignore the important reason for environmental protection.

3.2 Inadequate layout of indoor space

In the design of residential buildings, designers should not only have a deep understanding of the spatial structure of the building, but also organically integrate the indoor layout together, and try to use the least amount of space to store more items. However, because many designers themselves do not have a high degree of professionalism, they lack rich experience in the spatial construction and layering of buildings, and do not make maximum use of space. In this way, it not only causes the waste of space, but also has a certain negative impact on the whole space design.

3.3 Insufficient design of interior decoration elements

In the decoration of low-carbon homes, the selection of appropriate decorative materials is crucial, and it will have a great impact on the overall quality of the home. There are various methods of interior design, which requires designers to have high aesthetic taste and fully understand the different roles played by various elements in the design. Through the placement and setting of decorations, the indoor environment can be improved to bring a better living experience to the occupants. In addition, it is necessary to break through the original spatial limitations and combine design and creativity to make the residence more artistic and intimate, in line with the needs of the residents of the living environment. At present, the ability of designers in this regard still needs to be strengthened.

4. application method of low carbon concept in residential interior design

4.1 Low-carbon space design

In the design of energy-saving buildings, space plan-

ning plays a pivotal role.

First, functional division of space. For different residential units, it is necessary to make a reasonable allocation of space to form a specific spatial effect. When carrying out residential design, it is necessary to fully understand the characteristics and performance of each functional area, not only to take into account the needs of individual users, but also to optimise the space in an innovative way, and make better use of limited resources to promote the expansion of the functionality of indoor space.

Second, most occupants will have certain space needs, so the architectural space layout should be considered in residential design. The surface area of the room should be measured in advance, the internal space should be appropriately allocated, the units should be partitioned effectively, the storage space should be increased, the usage rate of the indoor space should be improved, the structure of the house should be improved, and the living experience of the occupants should be optimised^[1].

4.2 Low-carbon decorative design

In architectural design, the reasonable selection of low-carbon building materials is particularly critical, low-carbon decoration can not only improve the quality of living, but also greatly extend the service life of the product, not only can save energy, but also reduce the pollution of the environment, but also improve the user's living environment. For example, the use of environmentally friendly paints to decorate the walls can reduce environmental pollution, but also reduce the harm to the human body, but also to promote the popularity and development of the concept of green home^[2]. With the development of the times, people's understanding of environmental protection is becoming more and more profound, green interior space will be a major development direction in the future. Traditional interior decoration is mainly made of solid wood, but this material is generally not safe, and in the case of high humidity, it will often produce a large number of microorganisms and germs, which will cause great physical and mental harm to the occupants. The use of low carbon new building materials, its volatility is strong, not only to reduce the harm to the environment and human body, but also to enhance the sense of art of the residence.

4.3 Low-carbon display design

In the home space, display is an important element. Appropriate arrangement of interior decoration elements, can effectively use the interior space, to create a more stable,

more warm living environment. In the display design, it is necessary to pay attention to the comprehensive evaluation of the home environment, use furniture made of natural materials, meet the requirements of energy saving and green, so as to achieve the purpose of reducing environmental pollution^[3].

First of all, try to improve the furniture material to ensure the safety of users. Energy saving and emission reduction from all aspects, so as to achieve the purpose of extending the service life of the product. When purchasing modular furniture, choose furniture that can be disassembled and assembled arbitrarily, so as to adapt to the needs of users in different scenarios. Secondly, the use of fast-growing wood furniture is conducive to environmental protection and also contributes to the low-carbon and green development of residential decoration. Finally, low-carbon soft decoration style is an important part of modern residential decoration. Designers should fully understand the specific conditions of the residence, carry out reasonable design, and make scientific assessment of the internal space of the residence so as to achieve a high degree of coordination and unity.

In the process of soft decoration design, it is necessary to adhere to the principle of proportionality, not only to create a harmonious indoor environment, but also to fully take into account the needs of the users themselves. In the planning of housing, green furniture that can effectively reduce indoor toxic gases should be used, so that the air can be freshened, harmful gases adsorbed and the house purified. When choosing green plants, different plants should be selected according to the preferences and needs of the users. For example, plants such as greenery can be used to remove toxic gases from the house. In addition, green plants can create a warm living environment for people^[4].

4.4 Low-carbon environmental design

Firstly, in the light source design, natural light is introduced as much as possible.

It is necessary to increase the indoor lighting area as much as possible, in order to reduce the time of artificial light sources, reduce energy consumption, make the occupants more comfortable, and then improve their quality of life. Certain fluorescent lamps have the function of absorbing indoor toxic gases and can be used appropriately. At the same time, fibreglass ceilings can also be used to increase indoor lighting and reduce energy consumption, thus achieving better lighting effects.

Secondly, electricity and solar energy should be fully utilised for heating. In heating, solar panels can convert sunlight into heat energy to meet indoor heating needs.

The traditional effective way of heating is to burn coal, but this is not in line with the concept and requirements of environmental protection. Under the guidance of the low-carbon concept, the use of efficient solar energy saving technology can not only meet people's individual requirements, but also promote the effective use of resources.

Third, reduce noise. At present, environmental pollution is the focus of social concern, noise pollution has a non-negligible impact, seriously affecting people's normal life. Once the noise reaches 50 decibels and above, it will have a certain impact on human body functions, forming a potential threat. Therefore, when modernising interior design, the sound insulation effect of interior doors and windows should be taken into account. The design should be as airtight as possible, and stronger steel should be used as the main building material. The roof can be decorated with sound-absorbing materials, which can provide good sound insulation. In addition, doors and windows should be designed to ensure ventilation and odour dispersal, so as to improve the living comfort of users.

4.5 Eco-design

Eco-design is to integrate environmental factors into the design of the product to determine its development trend. Incorporating environmental elements into all aspects of product design can reduce the impact of products on the environment. Through the maintenance of the whole life cycle of the product, the goal of environmental protection is achieved, thus forming a sustainable production and consumption system. From the perspective of environmental protection, eco-design is a design strategy that reduces energy use and achieves sustainable development; from the business perspective, it reduces product design costs and potential dangers, and enhances product competitiveness.

When carrying out low-carbon design, it is important to focus on incorporating green concepts. Furniture and soft furnishings can be categorised, designed and arranged according to certain rules, and ultimately combined with the indoor environment, so that these elements can be harmoniously integrated into the original building to provide a more welcoming indoor living experience for the occupants. The green ideas of low carbon, low emission and high recycling should be fully implemented, and modern residences should be constructed in a low-carbon way so that people can rest and live more comfortably.

4.6 Adapting to local conditions to achieve low-carbon goals

When constructing energy-saving districts, it is nec-

essary to conduct comprehensive analyses and planning of the geology, geomorphology, topography, climate and plants around the buildings. Through comprehensive analyses of lighting, ventilation and other factors, various resources are reasonably used, and planning is carried out in a flexible and intelligent manner to ensure that the district is in harmony with nature. By integrating the surrounding environment, the residents' sense of living comfort and well-being can be enhanced, thus achieving the purpose of energy conservation and emission reduction. For example, it is necessary to carry out scientific planning for local lowlands, slopes and greenery, beautify the surrounding landscape, and set up a variety of functional subdivisions to improve the utilisation rate of landscape space and ensure the similarity between the building form and the space.

4.7 Integrated indoor and outdoor design

The construction of residential exterior walls generates a large amount of energy consumption, which is greatly related to the size of the exterior walls, so it is necessary to carry out reasonable modification of its appearance and accurately control the area of the exterior walls, so as to reduce energy consumption. In the specific design, it is also necessary to continuously optimise the shape of the building and its internal arrangement, making use of natural light and ventilation conditions, so that the structure of the house has a better function of heat preservation, shading and insulation, in order to reduce the load on the air-conditioning system and the lighting system, to reduce the cost of the construction and the energy consumption, and to ensure the comfort of indoor living.

Before designing, the optimal scheme should be determined through comparison, so as to reduce later changes and the influence of interior decoration on the building, so as to better show its function and importance, and to achieve the purpose of saving materials, lowering the cost, and improving economic and social benefits.

4.8 Interior Scale Renovation

With the development of the new city and the demolition of the old city, the living space of the residents is getting bigger and bigger, and people's requirements for the living environment are getting higher and higher. Indoor-scale renovation is based on the sharing of resources and facilities, and large-scale project construction, development and utilisation, which ensures the overall efficiency of the building and effectively reduces the use of raw materials, so as to achieve the purpose of saving energy.

5. Conclusion

While meeting people's psychological needs, modern design must comply with the trend of low carbon and low emission. Nowadays, people gradually pay attention to energy-saving and emission reduction residential design, and integrating the low-carbon concept into modern residential design can not only save investment, improve economic efficiency, but also reduce the pollution of the environment.

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