

Research on Green Building Materials and Human Settlement Quality Based on BIM Technology

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Abstract: With the development of society and technological progress, people's requirements for the living environment have been continuously improved in recent years, and green buildings have been greatly developed. In recent years, we can realize that BIM technology has obvious advantages in the process of green building materials management. The application of green building materials in construction projects provides people with a good living environment, promotes the connection between humans and the natural environment, and achieves a state of harmonious coexistence. Green building materials give full play to their role in human settlements. Create a better place for people to live together. Building information model can connect data, processes and resources in different stages of the whole process of construction project life cycle design, construction, material collection, operation, etc., so as to promote the coordinated management of departments in each stage of the project. In this paper, the management system of green new building materials based on BIM technology is studied in detail, and the feasibility of this system in real life is also comprehensively planned, hoping to provide some reform ideas for the further development of the construction industry.

1. Introduction

In order to realize the sustainable development of the construction industry and help build a resource-saving society, we must unswervingly take the road of green building development [1]. Green building materials are an important foundation for building green buildings, and its application effect will directly affect the success or failure of green building construction. BIM information technology is actually an information model, which is an integrated information model [2]. In the current construction work, BIM technology has been applied to many links such as project planning, construction and design [3]. Because the selection of green building materials from raw materials to waste is based on the protection of the natural environment, and the effective use of wind energy, solar energy and heat energy can minimize environmental pollution. Green building materials have the functions of deodorization, sterilization, humidity regulation, temperature regulation and radiation shielding, and can effectively protect people's bodies [4]. The building information model can connect the data, processes and resources in different stages of the whole process of construction project life cycle design, construction, material collection and operation, so as to promote the coordination and management of departments in each stage of the project [5].

The prerequisite for the development of green buildings is to continuously strengthen the management of green building materials to ensure the establishment of a comfortable and healthy environmental system [6]. Therefore, it is necessary to strengthen environmental protection, create a green and healthy living environment, strengthen the rational use of green building materials, and build green buildings [7]. My country is a country with large resources, but it is not inexhaustible [8]. The current environment is deteriorating, such as serious land desertification, serious air pollution, continuous heavy rains and earthquakes [9]. It can be imagined that if these serious problems can not be effectively controlled and solved, then the healthy living environment that people are eager to pursue can only be an armchair strategist with no practical significance [10]. At present, there are still many problems in the process of green building construction in China. Only by strengthening the research on these problems can we provide impetus for the development of China's construction industry.

2. Relationship between BIM technology and green building materials management

2.1 Management characteristics of green building materials

Green building materials should define the standards of green building materials before manufacturers produce them. In the production process, strict management should be carried out in strict accordance with the requirements of green building materials to ensure that the materials meet the requirements of green building materials. In the process of building materials management in the past, the traditional management mode was very extensive, which could no longer meet the requirements of green building materials management today. Green building materials are building materials that adopt cleaner production technology, do not use or use less natural resources and energy, use a large number of pollution-free, non radioactive solid wastes, can be recycled, do not affect human health and will not pollute the natural environment. Green building materials will not cause any harm to the environment in the process of material adoption, manufacturing, use and waste treatment, so as to maximize environmental protection and ensure human health. The system framework of building energy efficiency and green building model system is shown in the figure.

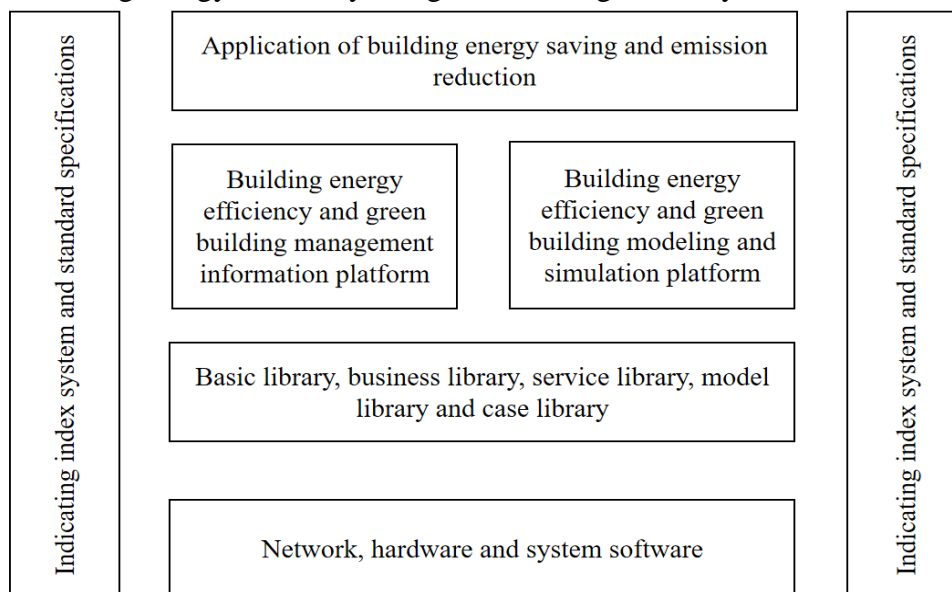


Figure 1: System framework of building energy efficiency and green building model system

Before manufacturers produce green building materials, they should clarify the standards of green building materials, and conduct strict management in strict accordance with the requirements of green building materials in the production process to ensure that the materials meet the requirements of green building materials. First, before the production of green building materials, the production enterprise should clarify the material standards, strictly control the production process and standards according to the relevant provisions on the use of materials, effectively supervise the details, ensure that the produced materials meet the requirements of green building materials, and provide products with different green degrees according to different construction requirements and customer requirements. At the same time, control the relationship between inventory, sales volume and production output. Second, the traditional management is very loose and extensive, which is not suitable for the many types of materials and suppliers. The traditional connection with reality should be more standardized, all-round and fine-grained management of green building materials, and play an effective role in management. Third, in the construction activities of the project, the material purchasing department should firstly meet the requirements of the project, and negotiate in advance all the department positions in the construction process. Based on this situation, it is necessary to adopt a refined management mode to manage the current green building materials. In the construction process of green building materials, it is necessary to select the types of green materials according to the requirements of different building designs.

2.2 The main points of BIM technology in the management system of green building materials

BIM technology, or building information model, is based on various information data of construction projects as the model. It has many advantages, including: coordination, simulation, visualization, graphability, and optimization. It is necessary to use reasonable management systems and management concepts in building construction, combine the specific use plan of building materials, and combine the functions of materials and production information for management. Material production starts from the manufacturer, and reasonable measures must be formulated for the management of the entire industrial chain. The role of each link in the industrial chain should participate in the process of building materials management, and the production, design, and construction of building materials should be clarified. . Only by perfecting the establishment of refined management system can we strengthen the management of building materials from all aspects and improve the management of material use and inquiry. At the end of the life of green building, the BIM database and RFID tag can also be used to accurately judge the green building materials of building components that can continue to be recycled during the demolition of building, so that the energy consumption of green building materials can be reduced and the healthy development of green building can be ensured. The optimal design process of green building based on BIM is shown in the figure.

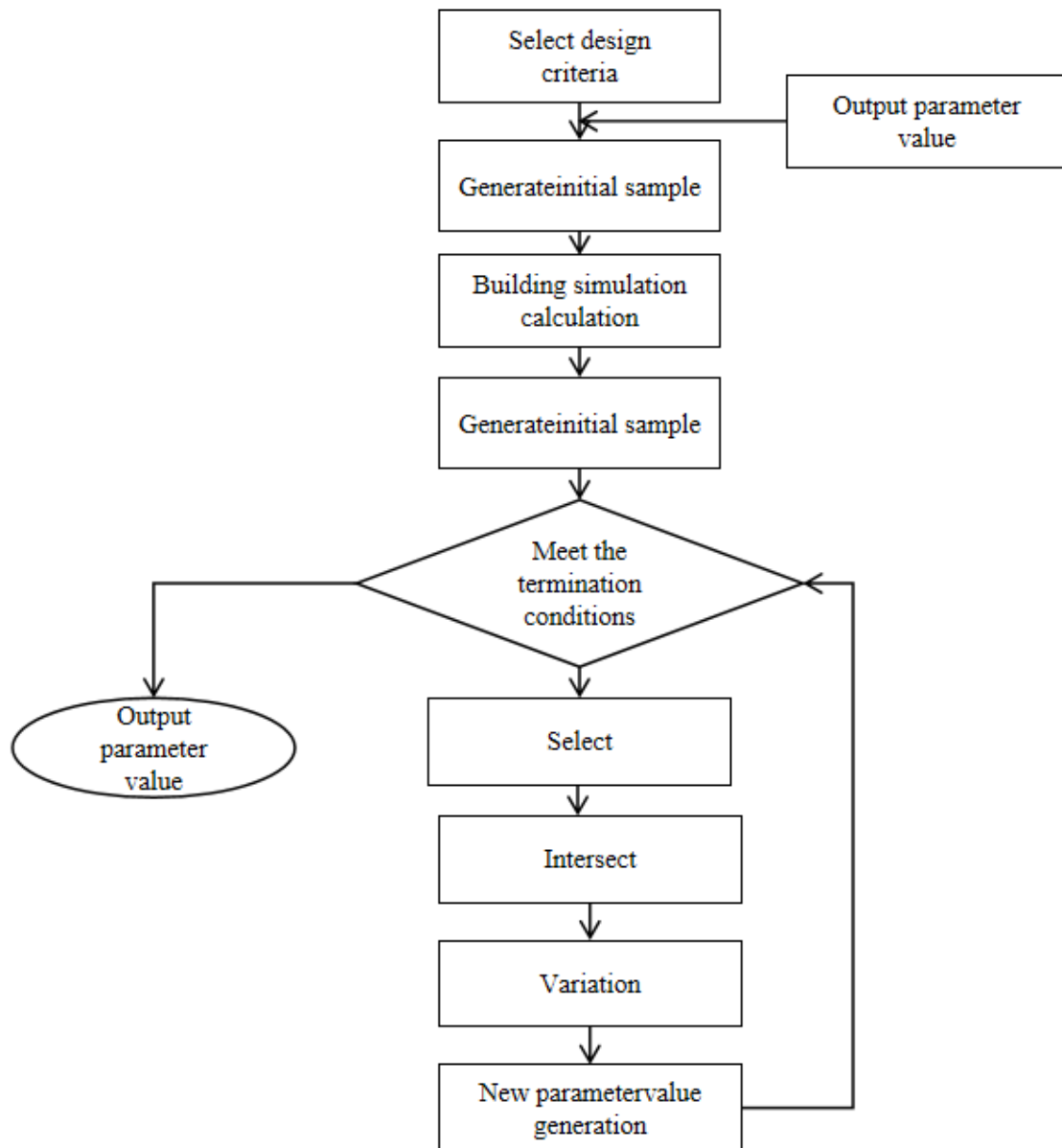


Figure 2: BIM-based optimal design process of green building

For the data information exchange link of BIM technology itself, the most basic thing is to realize the data information exchange, which is also a key to complete the information management and transmission of network and terminal equipment. In this process, BIM can enhance the accuracy and convenience of information management of materials used in construction. After the completion of the project, BIM information database can provide support for the information of management and maintenance in the later stage of the project, and form a circular information feedback. In the future use of green buildings, we can do a good job in building maintenance and improve the traceability of historical information by applying management-related information technology. In the whole life cycle of green buildings, it is very important to use BIM technology. Based on BIM technology, we can put forward relevant information parameters of green building materials and share and exchange information accurately, so as to achieve a high degree of integration of information resources, thus making more scientific and reasonable management decisions and providing basis for management.

3. Application of Green Building Materials in Human Settlement Environment

3.1 Problems in the creation of a healthy living environment

Our current quality of life continues to improve, but the quality of the living environment is declining. The population growth has been on an upward trend, the number of people continues to increase, and resources will continue to decrease. My country's economic development has caused certain impacts on the urban environment, including industrial waste water, carbon dioxide, suspended particulate matter, and dry light. The main cause of indoor environmental pollution is that there are a large number of harmful substances in modern building materials and decorative materials, and the most serious harm to the human body of the elderly, children and pregnant women. The quality of human health is closely related to the quality of the environment. With the increasing development of urban construction, people have gradually ignored the decline in the quality of their living environment. The rapid increase in population and the increasing shortage of environmental resources have brought severe challenges to our living environment.

The combination of people's houses and surrounding environment can reflect the significance of human settlements. However, there are more and more high-rise buildings in today's cities. High-rise residents live far away from the ground and the environment, which affects people's demand for the environment. Although there are green plants and green spaces in many residential quarters, it only reflects the beauty of the quarters. With people's in-depth understanding and understanding of it, as well as its advantages of low cost, flexible organization and strong vitality, it has been widely used in various fields in China, and gradually replaced the traditional masonry materials. Another important criterion that it can be used as a trusted green building material is that it can be recycled and reused.

3.2 How to build a healthy living environment

The living environment mainly refers to the environment where human beings live, carry out productive activities and a series of social activities. Green building is generally defined as a living environment that can bring people a healthy, comfortable, safe and stable feeling, and at the same time enable people to live, work and have a rest in it. Green building can minimize the waste of resources, make full use of resources and energy, and reduce the cost of raw materials. The living environment consists of social environment, natural environment and artificial environment, including not only houses, communities and cities, but also places of residence, work, education, health and entertainment. That is, using green building materials to realize the innovation of building energy-saving mode. General building energy efficiency is applicable to some ordinary houses with simple structure, while green building materials are applicable to a wider range of buildings.

Building materials belong to the basic material industry, which is an important industry for the development of China's national economy. It is also one of the industries that are easy to damage the environment and consume huge energy and natural resources. Green building materials are defined as building materials that will not pollute the human living environment and promote people's health. In addition, water, electricity and gas in residential areas have been measured separately, which has greatly improved people's awareness of energy conservation and effectively reduced energy consumption. Light steel can meet the standard of green building materials, and light steel has no harm to natural environmental protection and can be recycled. According to the demand of building structure, light steel of different specifications can be produced, that is, the length, thickness and width of light steel can be selected arbitrarily. Light steel will be paid more and more attention in construction engineering.

4. Conclusions

In summary, with the advancement of science and technology and social development, people are paying more and more attention to environmental protection. In the concept of building green and environmental protection, green building materials are the basic conditions for achieving green building. When BIM technology is applied to actual green building materials, it can be combined with the needs of green building construction, and BIM technology can be penetrated into material demand planning, material storage method optimization, material construction dynamic management, material operation and maintenance and disassembly, etc., to ensure the effective application of BIM Technology to improve the effectiveness of green building materials management. The application of green building materials in the human settlement environment is only reflected in the construction. Although it fails to fully express the human settlement environment, it also echoes the human settlement environment. From the perspective of the construction industry, the application of green building materials is a new direction for the development of the construction industry. The use of environmentally friendly materials can promote resource conservation and is more conducive to building a harmonious society. Build a conservation-oriented society. Promote the implementation of my country's sustainable development strategy. This will further promote the healthy development of my country's construction industry.

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