Application of Green Building Construction in Construction Management

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Abstract. The construction stage of the building project is an important link that takes the longest time, the most complex technology and the greatest impact on the quality level of the green building in the whole life cycle of the building. Therefore, the first step is to start from the construction stage in order to improve the quality management level of green building and realize the maximization of green building quality and environmental, economic and social benefits. This paper focuses on the construction quality management in the whole process of green building planning, design, construction, operation and scrapping system, introduces the idea of green building engineering, studies the construction quality problems of green building, and puts forward a new construction quality management strategy and mode. The new construction quality management strategy and mode can control the quality of green building construction stage, and promote the development and promotion of green building action.

Keywords: Green Building, Construction Management, B/S mode, .NET Framework, Routing Link Path.

1. Introduction
The construction stage is the link with the highest waste rate of resources, the largest energy consumption and the most serious environmental pollution in the whole life cycle of buildings [1-2]. However, the current green building construction quality management method mainly continues the traditional quality supervision, inspection, sampling and so on. The construction quality management method is relatively backward, which not only wastes a lot of human and material resources, but also cannot eliminate the quality problems from the source [3]. Therefore, an advanced construction quality management mode is urgently needed to promote the further development of green building. In this paper, green building construction is introduced into the construction management to make up for the shortcomings of the traditional mode, and a new green building mode is innovated on the basis of the traditional mode.
2. Correlation Theory

2.1. Meaning of construction quality management
For the construction engineering, the meaning is the collection of all activities of construction management [4], which is based on the determination of quality objectives, policies and functions in strict accordance with the relevant national quality specifications and quality standards. Quality management refers to the collection of all activities of construction management by means of quality planning, control, assurance and improvement and by means of corresponding quality inspection.

2.2. The concept of green building
The connotation of green building is very rich, which is fundamentally different from the greening [5]. It does not simply stack advanced technology and construction technology, but represents a concept and symbol. Generally speaking, green building refers to saving as much resources as possible in the whole life cycle of the building, such as land, water, energy, materials, etc. The whole life cycle includes the whole process from project initiation, planning, design, construction, later operation to demolition. While maintaining the ecological balance, green buildings create a clean, comfortable and efficient living environment for us, and maintain a balanced relationship with nature.

2.3. The meaning of green building construction quality management
Green building construction stage is the most important stage of green building for strengthening the quality management level of green building. The construction phase of green building is short [6], but its impact on the ecological environment is concentrated, and the consumption of resources and energy is the most. Green building construction quality management is a management activity aiming at environmental protection under the premise of ensuring the safety and reliability of the construction process and the strict control of the construction quality through advanced green construction technology and technology.

2.4. Quality management principles of green building construction
The construction process of green building is a process based on the concept of sustainable development [7, 8]. Green building construction quality management is to achieve low consumption, high efficiency, environmental protection as the principle, and to achieve green building construction process high efficiency, low consumption, environmental protection of the comprehensive benefit maximization as the goal. Therefore, the construction quality management of green building should be in line with the principle of organic and coordinated development of quality, society, environment and economic benefits.

3. Analysis of Green Building Construction Quality Management Process

3.1 The process analysis of green building quality management
From the perspective of green thinking, it is decided that external quality supervision and inspection should be gradually weakened in the process of green building construction quality management [9, 10]. Instead, self inspection and mutual inspection should be carried out through the connection of each process in the construction process, and the quality requirements of buildings should be gradually realized in the internal management process of the construction process. In the green construction, the staff of each functional department should participate in the process of quality management through design, procurement, implementation and final trial operation. After the completion of their own tasks, all parties involved shall carry out quality inspection to see if they meet the standard requirements. The next process can only be carried out after the quality meets the standard. At the same time, the operators of the next process shall recheck the previous results. In case of non-compliance, feedback and repair work shall be carried out immediately. Only when there is no problem at all can we continue to follow the process. In the construction of green buildings, we must completely put an end
to the extremely wasteful behavior of quality rework, avoid rework through management methods, save costs, shorten the construction period, and control the quality standard of green buildings at the source.

3.2 Analysis on the value flow of green building quality management

In the process of quality management, the operation process in the process of green building construction needs to carry out quality value analysis, identify the quality management activities, distinguish the operation activities that can add value from the operation activities that are unnecessary and wasteful, and then realize the construction of green building construction quality management by eliminating the wasteful behaviors that have no value. The process of comprehensive evaluation of green building construction quality management is shown in Fig.1.

![Diagram of comprehensive evaluation process](image)

**Figure 1.** Process of comprehensive evaluation of green building construction quality management

3.3 The determination of evaluation index weight

After the index system is determined, appropriate methods should be selected to determine the weight. Generally speaking, AHP is used to determine the weight of the evaluation index and get the weight of different levels of the index on the basis of the evaluation index system, so as to ensure the scientificity and objectivity of each index and weight in the comprehensive benefit of green building construction. In the weight determination, the judgment matrix is established according to the constructed evaluation index system, the maximum eigenvalues and eigenvectors of the matrix are calculated according to the judgment matrix, and the consistency is tested at the same time to obtain the index weight corresponding to the criteria layer and the target layer.

Generally, there are two methods to determine the index weight: subjective and objective method, which weights each index according to people's knowledge, experience and information. Objective weight method refers to the method that obtains the weight directly after processing the original data of each index. In this paper, factor analysis is used to determine the weight. This method takes the variance contribution rate of the principal components as the weight value, and normalizes the weighted average value of the index coefficient of the linear combination of the principal components.

The evaluation set is

\[ U = \{u_1, u_2, ..., u_q\} \]  

The evaluation matrix is as follows
In the formulas, $D_i$ indicates the prime evaluation matrix of the $i$ evaluation criteria, $S_{ij}^{(q)}$ the membership degree of the $j$ evaluation index attached to the $q$ comment, and $v_{ij}^q$ the number of comments relative to $A_q$ attached to different comment levels.

The difference between green building construction quality management and traditional construction quality management is also its ultimate goal is to achieve the unity of quality and economic benefits, environmental benefits and social benefits. Green building and traditional building are based on the owner's quality requirements, through the way agreed in the contract, to carry out quality management, and finally achieve the quality objectives of construction products. The difference is that the quality management theory of green building has not changed, but the introduction of circular economy and low-carbon economy theory is attention to the quality level. In the design stage, it is necessary to ensure energy conservation, environmental protection, low-carbon and later operation cost reduction of the design scheme; in the material and equipment procurement stage, it is necessary to ensure the green degree of building materials and low energy consumption of equipment and appliances; in the construction stage, it is necessary to control the quality of green new materials, new structures and new processes, so the construction quality management of green buildings is a comprehensive quality management.

4. Conclusion
This paper expounds the process of construction quality management of green building in detail, analyzes the quality value flow of construction quality management in the process of green building construction according to the green construction thought, sums up the waste behavior of all parties in the quality management of building engineering, and forms the strategy of construction quality management of green building in combination with the green construction management method, which is the future green construction. The construction of color building construction quality management mode provides method support.

References
[1] Liu Zhenxiao, Chen Jianhong. Evaluation of Rehabilitation Benefits of Deserted Land of Tailings Based on Fuzzy Comprehensive Judgment. Mining Research and Development, 2010, 4(30):97-100.
[2] Zhang Yanjun, Cheng Hui, Li Yuefen et al. A Study on Comprehensive Benefits of Saline-alkali Land Consolidation based on Fuzzy Comprehensive Evaluation-with a Case Study of Da'an City. Journal of Anhui Agricultural Sciences, 2012, 40(30):14988-14990.
[3] Kern,Eva, Hilty,Lorenz, Guldner,et al.Sustainable software products-towards assessment criteria for resource and energy efficiency. Future Generation Computer Systems, 2018, 2018(86):199-210.
[4] Molognoni D, Chiarolla S, Ceconet D, et al.Industrial wastewater treatment with a bioelectrochemical process:assessment of depuration efficiency and energy production. 2018,77(1):134.
[5] Pahlavan R,Omid M,Akram A.Application of Data Envelopment Analysis for Performance
Assessment and Energy Efficiency Improvement Opportunities in Greenhouses Cucumber Production. 2018,14(3):1465-1475.

[6] Hemanand T, Subramaniam N P, Hemanand T, et al. Design of Hybrid Photovoltaic/Wind Integration of Microgrid Using Intelligent Controller. 2017,14(3):1589-1598.

[7] Sandeep Chatterjee, Valeriy Sukharev, Farid N. Najm. Power Grid Electromigration Checking Using Physics-Based Models. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2018, 37(7):1317-1330.

[8] Jin-Young Choi, In-Sun Choi, Geon-Ho Ahn, et al. Advanced Power Sharing Method to Improve the Energy Efficiency of Multiple Battery Energy Storages System. IEEE Transactions on Smart Grid, 2018, 9(2):1292-1300.

[9] Brejda J J, Karlen D L, Smith J L et al. Identification of regional soil quality factors and indicators: II. Northern Mississippi Loess Hills and Prairie. Soil Science Society of America Journal, 2000, 64: 2125-2135.

[10] Kok K, M Winograd. Modelling land-use change for Central America, with special reference to the impact of hurricane Mitch. Ecological Modelling, 2002, 149: 53-69.